

=> d que l36

L4 1 SEA FILE=REGISTRY ABB=ON PLU=ON STYRENE/CN
L9 1 SEA FILE=REGISTRY ABB=ON PLU=ON ACRYLIC ACID/CN
L10 1 SEA FILE=REGISTRY ABB=ON PLU=ON ACRYLAMIDE/CN
L12 2 SEA FILE=REGISTRY ABB=ON PLU=ON ("DIMETHYLACRYLAMIDE
HOMOPOLYMER"/CN OR "DIMETHYLACRYLAMIDE, HOMOPOLYMER"/CN)
L13 4307173 SEA FILE=HCAPLUS ABB=ON PLU=ON SUBSTRATE OR SURFACE OR GLASS
OR SILIC?
L14 354874 SEA FILE=HCAPLUS ABB=ON PLU=ON SILICA+PFT,NT/CT
L15 281364 SEA FILE=HCAPLUS ABB=ON PLU=ON GLASS+PFT,NT/CT
L16 25366 SEA FILE=HCAPLUS ABB=ON PLU=ON (L13 OR L14 OR L15) AND
(HYDROPHOB? OR STYRENE? OR L4) AND (HYDROPHIL? OR L9 OR L10 OR
L12 OR ACRYLAMID? OR DIMETHYLACRYLAMID? OR ACRYLIC ACID)
L17 12113 SEA FILE=HCAPLUS ABB=ON PLU=ON L16 AND (SUBSTRATE OR GLASS
OR SILICA)
L18 1094 SEA FILE=HCAPLUS ABB=ON PLU=ON L17 AND HYDROPHOB?(3A) (LAYER
OR COAT? OR SURFAC?) AND HYDROPHIL?(3A) (LAYER OR COAT? OR
SURFAC?)
L20 1515 SEA FILE=HCAPLUS ABB=ON PLU=ON L17 AND ?STYREN? AND ?ACRYLAMI
D?
L21 13 SEA FILE=HCAPLUS ABB=ON PLU=ON L20 AND ?BRUSH?
L22 6 SEA FILE=HCAPLUS ABB=ON PLU=ON L18 AND ?BRUSH?
L23 19 SEA FILE=HCAPLUS ABB=ON PLU=ON L21 OR L22
L28 1554 SEA FILE=HCAPLUS ABB=ON PLU=ON POLYMER?(3A)?BRUSH?
L29 21 SEA FILE=HCAPLUS ABB=ON PLU=ON L28 AND HYDROPHOB? AND
HYDROPHIL? AND (SUBSTRAT? OR SILICA? OR ?GLASS?)
L30 36 SEA FILE=HCAPLUS ABB=ON PLU=ON L29 OR L23
L31 5426 SEA FILE=HCAPLUS ABB=ON PLU=ON HYDROPHOB? AND HYDROPHIL? AND
(SUBSTRAT? OR SILICA? OR ?GLASS?)
L32 21399 SEA FILE=HCAPLUS ABB=ON PLU=ON "IMMOBILIZATION, MOLECULAR OR
CELLULAR"+PFT,NT/CT
L33 268 SEA FILE=HCAPLUS ABB=ON PLU=ON L31 AND (L32 OR IMMOBILI?)
L34 17318 SEA FILE=HCAPLUS ABB=ON PLU=ON BIOCHEMICAL MOLECULES+PFT/CT
OR BIOMOLECUL?
L35 20 SEA FILE=HCAPLUS ABB=ON PLU=ON L33 AND L34
L36 54 SEA FILE=HCAPLUS ABB=ON PLU=ON L30 OR L35

=> d l36 ibib abs hitind 1-54

L36 ANSWER (1) OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2004:387306 HCAPLUS
DOCUMENT NUMBER: 140:388198
TITLE: Multicomponent protein microarrays
INVENTOR(S): Brennan, John D.; Rupcich, Nicholas
PATENT ASSIGNEE(S): McMaster University, Can.
SOURCE: PCT Int. Appl., 44 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|------|----------|-----------------|----------|
| WO 2004039487 | A1 | 20040513 | WO 2003-CA1665 | 20031103 |
| W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, | | | | |

GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK,
 LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ,
 OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,
 TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW
 RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY,
 KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES,
 FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR,
 BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

PRIORITY APPLN. INFO.: US 2002-422892P P 20021101

AB The present invention involves a multicomponent protein microarray comprising two or more components of a protein-based system entrapped within spots of a biomol. compatible matrix arranged on a surface. Also included are methods of using the microarray for multicomponent anal. along with kits and machinery comprising the microarray.

IC ICM B01J019-00
 ICS G01N033-552

CC 9-1 (Biochemical Methods)

IT **Immobilization, molecular or cellular**
 (Entrapment; multicomponent protein microarrays)

IT **Biochemical molecules**
 (compatible matrix; multicomponent protein microarrays)

IT Polymers, uses
 RL: DEV (Device component use); USES (Uses)
 (hydrophilic, hydrophobic, neutral or charged organic;
 multicomponent protein microarrays)

IT Adhesion, physical
 Animal
 Biosensors
 Ceramics
 Cleaning
 Composites
 Coupling agents
 Databases
 Gels
 Humectants
Hydrophilicity
 Machinery
 Medical goods
 Micromachines
 Organic matter
 Polyelectrolytes
 Sols
 Solutions
 Surface
 Test kits
 Therapy
 Toxicity
 (multicomponent protein microarrays)

IT **Glass, uses**
 RL: DEV (Device component use); USES (Uses)
 (multicomponent protein microarrays)

IT 50-69-1, Ribose 50-70-4, Sorbitol, uses 50-70-4D, Sorbitol, silane
 derivs. 50-99-7, D-Glucose, uses 56-81-5, Glycerol, uses 56-81-5D,
 Glycerol, silane derivs. 56-82-6, Glyceraldehyde 57-48-7, D-Fructose,
 uses 57-50-1, Sucrose, uses 58-86-6, Xylose, uses 59-23-4,
 D-Galactose, uses 63-42-3, Lactose 65-42-9, Lyxose 69-79-4, Maltose
 69-79-4D, Maltose, silane derivs. 87-79-6, L-Sorbose 99-20-7,
 Trehalose 107-97-1, Sarcosine 147-81-9, Arabinose 528-50-7,

Cellobiose 919-30-2, Aminopropyltriethoxysilane 1344-09-8, Sodium
silicate 1758-51-6, Erythrose 2152-76-3, Idose 3458-28-4,
 D-Mannose 5987-68-8, Altrose 6038-51-3, Allose 9000-69-5, Pectin
 9004-54-0, Dextran, uses 9004-54-0D, Dextran, silane derivs.
 9005-82-7, Amylose 19163-87-2, Gulose 25322-68-3, Polyethylene glycol
 29884-64-8, Threose 30077-17-9, Talose 37231-28-0, Melittin
 498579-33-2

RL: DEV (Device component use); USES (Uses)
 (multicomponent protein microarrays)

L36 ANSWER (2) OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2004:231061 HCAPLUS

DOCUMENT NUMBER: 141:24383

TITLE: Mixed **polymer brushes** with thermal
 response amplified by roughness

AUTHOR(S): Usov, Denys; Nitschke, Mirko; Chitry, Vladimir;
 Ulbrich, Karel; Minko, Sergiy; Stamm, Manfred

CORPORATE SOURCE: Institut fuer Polymerforschung Dresden e. V., Dresden,
 D-01069, Germany

SOURCE: Polymeric Materials Science and Engineering (2004),
 90, 622-623

CODEN: PMSEDG; ISSN: 0743-0515

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal; (computer optical disk)

LANGUAGE: English

AB Surface immobilized poly(N-iso-Pr **acrylamide**)

(PNiPAAm) layers show reversible gradual change of water advancing contact
 angle from **hydrophilic** (<50°) at ambient temperature to
hydrophobic (90-120°) above 40°. The receding water
 contact angle remains unchanged (about 40°) upon the thermal
 transition. In this report an approach how to broaden the range of the
 thermal switching and simultaneously reduce the contact angle hysteresis
 was described with the concept of mixed **polymer brushes**
 covalently grafted to a rough **substrate**. The high roughness of
 the **substrate** amplifies the thermal switching of wettability,
 while presence of the second **hydrophobic polymer** in
 the **brush** elevates the receding contact angle and thus reduces
 the water contact angle hysteresis.

CC 37-5 (Plastics Manufacture and Processing)

ST **polymer brush substrate** grafting water
 contact angle hysteresis

IT Polymers, preparation

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
 (graft; preparation of mixed **polymer brushes** and their
 thermal switching of wetting properties)

IT Wettability

(of **substrate surfaces** covered by mixed
polymer brushes)

IT Fluoropolymers, preparation

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
 (reaction product with α,ω -dicarboxy-terminated
 (meth)acrylate polymers, graft; preparation of mixed **polymer**
brushes and their thermal switching of wetting properties)

IT Contact angle

(water; of **substrate surfaces** covered by mixed
polymer brushes)

IT 2530-83-8, γ -Glycidoxypropyltrimethoxysilane

RL: MOA (Modifier or additive use); USES (Uses)
 (preparation of mixed **polymer brushes** and their thermal

switching of wetting properties)

IT 7440-21-3DP, **Silicon**, reaction product with α,ω -dicarboxy-terminated (meth)acrylate polymers, graft 7631-86-9DP, **Silicon** dioxide, reaction product with α,ω -dicarboxy-terminated (meth)acrylate polymers, graft 9002-84-0DP, PTFE, reaction product with α,ω -dicarboxy-terminated (meth)acrylate polymers, graft 28407-09-2DP, 2,3,4,5,6-**Pentafluorostyrene-styrene** copolymer, α,ω -dicarboxy-terminated, reaction product with **silicon** or PTFE, graft 98888-24-5DP, Methyl acrylate-1,1,1,3,3,3-hexafluoroisopropyl methacrylate copolymer, α,ω -dicarboxy-terminated, reaction product with **silicon** or PTFE, graft

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation) (preparation of mixed **polymer brushes** and their thermal switching of wetting properties)

REFERENCE COUNT: 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L36 ANSWER 3 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2004:230926 HCAPLUS

DOCUMENT NUMBER: 141:38955

TITLE: Photochemical structuring of binary **polymer brush** layers via photodimerization

AUTHOR(S): Hoffmann, Frank; Wolff, Thomas; Minko, Sergiy; Stamm, Manfred

CORPORATE SOURCE: Institut fuer Physikalische Chemie, Technische Universitaet Dresden, Dresden, 01062, Germany

SOURCE: Polymeric Materials Science and Engineering (2004), 90, 374-375

CODEN: PMSEDG; ISSN: 0743-0515

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal; (computer optical disk)

LANGUAGE: English

AB Switchable binary **polymer brushes** grafted to Si-wafers were prepared from **hydrophilic** and **hydrophobic** polymer components. When exposed to solvents, either the **hydrophobic** or the **hydrophilic** component extends into the liquid phase, depending on the polarity of the solvent. The **hydrophilic** component was poly-2-vinylpyridine, the **hydrophobic** component was made photocrosslinkable in that a polystyrene copolymer containing a photodimerizing chromophore was used. In this system surfaces differing in water contact angle between 60° and 100° can be produced by variation of the solvent. The chromophore was phenylindene, which forms crosslinks upon direct UV-irradiation. Therefore, the polystyrene component can be fixed in the extended or collapsed state. By irradiation through an appropriate mask, surfaces can be structured and the structures fixed.

CC 35-8 (Chemistry of Synthetic High Polymers)

ST photochem structuring binary **polymer brush** layer photodimerization

IT Crosslinking (photochem.; photochem. structuring of binary **polymer brush** layers via photodimerization)

IT Dimerization (photodimerization; photochem. structuring of binary **polymer brush** layers via photodimerization)

IT Polymer morphology (structure formation; photochem. structuring of binary **polymer brush** layers via photodimerization)

IT 25014-15-7, Poly(2-vinylpyridine) 216872-32-1, Styrene-2-(4-styryl)indene copolymer
RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent)
(brushes on silicon **substrate**; photochem. structuring of
binary **polymer brush** layers via photodimerization)
IT 7440-21-3, Silicon, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(**substrate**; photochem. structuring of binary **polymer**
brush layers via photodimerization)
REFERENCE COUNT: 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L36 ANSWER 4 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2004:230917 HCAPLUS
DOCUMENT NUMBER: 141:29169
TITLE: Designing nanoscale surface layers with tunable
properties
AUTHOR(S): Tsukruk, Vladimir V.
CORPORATE SOURCE: Department of Materials Science and Engineering, Iowa
State University, Ames, IA, USA
SOURCE: Polymeric Materials Science and Engineering (2004),
90, 357
CODEN: PMSEDG; ISSN: 0743-0515
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal; (computer optical disk)
LANGUAGE: English
AB The fabrication of nanoscale surface layers with tunable properties from
functionalized macromols. and carbon nanotubes is described. A grafting
process was used to fabricate binary polymer layers from poly(Me acrylate)
and styrene-2,3,4,5,6-pentafluorostyrene copolymer on a Si wafer,
producing thick dense mixed brush layers whose surface exhibits either
complete vertical, or a combination of vertical and lateral microphase
segregation. The lateral and vertical reorganization of the mixed brush
layer was quick (on the order of a few minutes), and reversible for at
least 100 switches between good and bad solvent states for each component.
Y-shaped brush layers chemical grafted to the silicon surface were also
produced, where spatial constraints imposed by a covalent junction of two
dissimilar (**hydrophobic** and **hydrophilic**) polymer chains in Y-shaped mols. caused formation of micelles with segregated
surface structures (pinned and crater-like), which measure only 10 nm in
diameter. Ordered arrays of carbon nanotubes in bent and straight states were
prepared using wet deposition of nanotube solns. on a patterned surface.
Highly oriented and textured nanotube arrays of different types and
nanotube loops of different shapes were formed on amine-terminated silicon
surface stripes, of interest for electronics applications.
CC 66-5 (Surface Chemistry and Colloids)
Section cross-reference(s): 38, 76
IT Nanotubes
(carbon, patterned surface arrays; fabrication of nanoscale
polymer brush mech. tunable surface layers and carbon
nanotube arrays)
IT **Hydrophilicity**
Hydrophobicity
Micelles
Surface structure
Swelling, physical
(fabrication of nanoscale **polymer brush** mech.
tunable surface layers and carbon nanotube arrays)
IT 9003-21-8, Poly(methyl acrylate) 28407-09-2, 2,3,4,5,6-

Pentafluorostyrene-styrene copolymer

RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)

(fabrication of nanoscale **polymer brush** mech.

tunable surface layers and carbon nanotube arrays)

IT 7440-44-0, Carbon, properties

RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)

(nanotubes, patterned surface arrays; fabrication of nanoscale

polymer brush mech. tunable surface layers and carbon

nanotube arrays)

IT 7440-21-3, Silicon, uses

RL: NUJ (Other use, unclassified); USES (Uses)

(**substrates**; fabrication of nanoscale **polymer**

brush mech. tunable surface layers and carbon nanotube arrays)

REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L36 ANSWER 5 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2004:228518 HCAPLUS

TITLE: Mixed **polymer brushes** with thermal response amplified by roughness

AUTHOR(S): Usov, Denys; Nitschke, Mirko; Chitry, Vladimir; Ulbrich, Karel; Minko, Sergiy; Stamm, Manfred

CORPORATE SOURCE: Institut fuer Polymerforschung Dresden, Dresden, 01069, Germany

SOURCE: Abstracts of Papers, 227th ACS National Meeting, Anaheim, CA, United States, March 28-April 1, 2004 (2004), PMSE-364. American Chemical Society: Washington, D. C.

CODEN: 69FGKM

DOCUMENT TYPE: Conference; Meeting Abstract

LANGUAGE: English

AB Surface immobilized poly(N-iso-Pr acrylamide) (PNiPAAm) layers show reversible gradual change of water advancing contact angle from **hydrophilic** (<50°) at ambient temperature to **hydrophobic** (90-120°) above 40 °C. The receding water contact angle remains unchanged (about 40°) upon the thermal transition. In this report we describe an approach how to broaden the range of the thermal switching and simultaneously reduce the contact angle hysteresis. We use the concept of mixed **polymer brushes** covalently grafted to a rough **substrate**. The high roughness of the **substrate** amplifies the thermal switching of wettability, while presence of the second **hydrophobic polymer** in the **brush** elevates the receding contact angle and thus reduces the water contact angle hysteresis.

L36 ANSWER 6 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2004:223967 HCAPLUS

TITLE: Smart surfaces via surface-initiated **polymer brushes**

AUTHOR(S): Brown, Andrew A.

CORPORATE SOURCE: Melville Laboratory - Department of Chemistry, University of Cambridge, Cambridge, CB3 1EW, UK

SOURCE: Abstracts of Papers, 227th ACS National Meeting, Anaheim, CA, United States, March 28-April 1, 2004 (2004), COLL-365. American Chemical Society: Washington, D. C.

CODEN: 69FGKM

DOCUMENT TYPE: Conference; Meeting Abstract
LANGUAGE: English

AB **Polymer brushes** have been widely used to tailor surface properties such as wettability, biocompatibility, corrosion resistance and friction. The advantage of **polymer brushes** over other surface modification methods (e.g. self-assembled monolayers) is their mech. and chemical robustness, coupled with a high degree of synthetic flexibility towards the introduction of a variety of functionality. Ideally, the synthetic method to functionalise surfaces with **polymer brushes**, should allow full control over the thickness, d. and composition of the polymer films, while at the same time be compatible with **substrates** that are used in polymeric devices. Surface-initiated **polymns.** of **polymer brushes** (or grafting from method) has been very successful in this controlled growth and a variety of **polymer brushes** has been grown using different "living" polymerization conditions. Brushes can be grown from planar surfaces or particles, from polymers and from inorg./metallic **substrates**. **Polymer brushes** can be used to prepare fully protein resistant properties, but by growing 'smart' polymers such as PNIPAM or charged brushes, surfaces with reversible characteristics can be fabricated. Here, we will discuss surfaces which can be switched from **hydrophilic** to **hydrophobic** using temperature or pH switches. We will also demonstrate reversible collapse of brushes, as a first step towards using **polymer brushes** as nanoactuators.

L36 ANSWER 7 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2003:930768 HCAPLUS
DOCUMENT NUMBER: 139:396611
TITLE: Synthesis of functional polymers and block copolymers on **silicon oxide surfaces** by nitroxide-mediated living radical polymerization in vapor phase
INVENTOR(S): Chang, Ying Chih; Li, Jun; Chen, Xiaoru
PATENT ASSIGNEE(S): USA
SOURCE: U.S. Pat. Appl. Publ., 17 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|------|----------|-----------------|------------|
| US 2003219535 | A1 | 20031127 | US 2003-360443 | 20030207 |
| PRIORITY APPLN. INFO.: | | | US 2002-355733P | P 20020207 |

AB A method for forming organic thin films comprises: providing a **substrate** having a **surface**, covalently pre-immobilizing a derivative of 2,2,6,6-tetramethylpiperidinyloxy (TEMPO) based alkoxyamine containing trimethoxysilyl on the **surface** of the **substrate** with the TEMPO group at the free end, and growing a grafted polymer layer in vapor phase on the pre-immobilized **surface** by means of living radical polymerization. The polymerization of vaporized vinyl monomers, including **acrylic acid**, **styrene**, N-2-(hydroxypropyl) **methacrylamide** and N-iso-Pr **acrylamide** on **silicon wafers** is demonstrated. FTIR, ellipsometry and contact angle goniometry were used to characterize the chemical structures, thickness and **hydrophilicity** of the films. The growth of film is linearly

proportional to its reaction time, leading to the easy and exact control of polymer film thickness from nanometers to submicrons. The capability of polymerizing various monomers allows us to fabricate various functional polymer **brushes**. The reversible thermo-responsiveness of a 200 nm thick grafted poly(NIPAAm) film in aqueous solution is demonstrated with

over

50% change in thickness at its lower critical solution temperature. A tri-block copolymer of poly(**acrylic acid**)-b-poly(**styrene**)-b-poly(**hydroxypropylmethacrylamide**) is successfully synthesized, proving the renewability of TEMPO-mediated polymerization at vapor phase. **Surface** polymer composition and morphol. is thus controlled at nanoscale by utilizing vapor phase **surface**-initiated controlled polymerization

IC ICM C23C016-00

NCL 427255600

CC 38-2 (Plastics Fabrication and Uses)

Section cross-reference(s): 76

ST living radical polymn TEMPO initiator thin film **silicon** wafer

IT Polymerization

(living, radical; synthesis of functional polymers and block copolymers on **silicon** oxide **surfaces** by nitroxide-mediated living radical polymerization in vapor phase)

IT Semiconductor materials

(**substrate**; synthesis of functional polymers and block copolymers on **silicon** oxide **surfaces** by nitroxide-mediated living radical polymerization in vapor phase)

IT 2564-83-2D, TEMPO, derivs. 626244-27-7

RL: CAT (Catalyst use); USES (Uses)

(synthesis of functional polymers and block copolymers on **silicon** oxide **surfaces** by nitroxide-mediated living radical polymerization in vapor phase)

IT 9003-01-4P, Polyacrylic acid 9003-53-6P, **Polystyrene**

25189-55-3P, N-**Isopropylacrylamide** homopolymer 40704-75-4P,

N-(2-Hydroxypropyl)**methacrylamide** homopolymer 626244-28-8P

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(synthesis of functional polymers and block copolymers on **silicon** oxide **surfaces** by nitroxide-mediated living radical polymerization in vapor phase)

L36 ANSWER 8 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2003:705833 HCAPLUS

DOCUMENT NUMBER: 140:112074

TITLE: Ellipsometric studies of nonionic block copolymers adsorbed at the solid/water and oil/water interfaces

AUTHOR(S): Kapilashrami, Abha; Malmsten, Martin; Eskilsson, Krister; Benjamins, Jan-Willem; Nylander, Tommy

CORPORATE SOURCE: Institute for Surface Chemistry, Stockholm, S-114 86, Swed.

SOURCE: Colloids and Surfaces, A: Physicochemical and Engineering Aspects (2003), 225(1-3), 181-192
CODEN: CPEAEH; ISSN: 0927-7757

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB We report on the interfacial behavior of a series of nonionic diblock copolymers at solid **hydrophobic** and **hydrophilic** **surfaces**/water and **silicone** oil/water interfaces, studied by ellipsometry. The polymers consist of a **hydrophobic**

C18 chain linked to a **hydrophilic** poly(ethylene oxide) (PEO), block varying from 50 to 250 U. The adsorption of these copolymers at low bulk concns. was found to be dominated by the PEO block at all interfaces. At higher concentration the copolymer forms **surface** aggregates at the **silica surface** whereas we observe a gradual increase in the adsorbed layer thickness with increased **surface** excess at the solid **hydrophobic surface**, indicating a transition from a flat conformation to **brush**-like layer structure. The results indicate a similar evolution in adsorbed amount with concentration at

the

silicone oil/water interface as at the **hydrophobic silica surface**. The influence of the rheol. properties of the interface on the adsorption of the diblock copolymer was investigated by comparing results from two **silicon** oils with different viscosities. The copolymers were found to have stronger affinity to a low viscosity (990 mPa s) **silicone** oil than to a higher viscosity (12 800 mPa s) **silicone** oil and the **hydrophobized silica surface**. At the **silicone** oil/water interface the adsorption of a com. nonionic triblock copolymer was furthermore investigated and compared with the diblock copolymers.

CC 37-5 (Plastics Manufacture and Processing)

Section cross-reference(s): 66

IT Adsorption

Interface

Surface

Thickness

(ellipsometric studies of nonionic block copolymers adsorbed at solid/water and oil/water interfaces)

IT 7631-86-9, **Silica**, uses 9016-00-6, Dimethylsilanediol homopolymer, sru

RL: NUU (Other use, unclassified); USES (Uses)

(ellipsometric studies of nonionic block copolymers adsorbed at solid/water and oil/water interfaces)

REFERENCE COUNT: 32 THERE ARE 32 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L36 ANSWER 9 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2003:623217 HCAPLUS

DOCUMENT NUMBER: 139:292752

TITLE: Y-Shaped Polymer Brushes:

Nanoscale Switchable Surfaces

AUTHOR(S): Julthongpiput, Duangrut; Lin, Yen-Hsi; Teng, Jing; Zubarev, Eugene R.; Tsukruk, Vladimir V.

CORPORATE SOURCE: Department of Materials Science Engineering, Iowa State University, Ames, IA, 50011, USA

SOURCE: Langmuir (2003), 19(19), 7832-7836

CODEN: LANGD5; ISSN: 0743-7463

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Nanoscale **surface** structures were observed, of segregated pinned micelles of grafted Y-shaped mols. which undergo reversible structural reorganization. The Y-shaped mols. were designed by combining two highly incompatible, i.e., **hydrophobic** and **hydrophilic** polymer chains (arms) attached to a single focal point capable of chemical grafting to a self-assembled monolayer of epoxysilane as functionalized **silicon surface**. The Y-shaped mols. comprise a polystyrene (PS) arm containing about 40 monomeric units and poly(tert-Bu

acrylate) (PBA) arm containing 30 units and 3,5-dihydroxybenzoic acid is used as AB2 anchoring moiety on Si to which carboxy-terminated PS and PBA were attached. Spatial constraints induced by the chemical bonding of two dissimilar (**hydrophobic** and **hydrophilic**) polymer arms in such Y-shaped mols. lead to the formation of segregated pinned micellar structures in chemical grafted **brush** layers; post-grafting hydrolysis of the PBA arms was conducted under acidic conditions. The final Y-shaped **brush** layers are composed of amphiphilic mols. with a volume ratio of PS and poly(**acrylic acid**) (PAA) arms of approx. 60:40. A model is proposed, of segregated pinned micelles and corresponding reverse micelles featuring different segregation states of polystyrene and poly(**acrylic acid**) arms. These arms are capable of local reversible rearrangements leading to reversible **surface** structural reorganization in different solvents.

CC 36-6 (Physical Properties of Synthetic High Polymers)

Section cross-reference(s): 66

ST polystyrene tertbutyl acrylate **polymer Y brush** arm bonding **surface**; **silicon** epoxysilane self assembled monolayer **silicon** nanosurface; pinning micelle **hydrophobic hydrophilic** arm dihydroxybenzoic acid

IT Contact angle

Hydrophilicity

Hydrophobicity

Polymer morphology

Self-assembled monolayers

(Y-shaped **hydrophobic/hydrophilic polymer**

brush micelles anchored on **silicon** forming nanoscale solvent-switchable **surfaces**)

IT Amphiphiles

Nanostructures

(Y-shaped **layers**; Y-shaped **hydrophobic/**

hydrophilic polymer brush micelles anchored on **silicon** forming nanoscale solvent-switchable **surfaces**)

IT Micelles

(Y-shaped; Y-shaped **hydrophobic/hydrophilic**

polymer brush micelles anchored on **silicon** forming nanoscale solvent-switchable **surfaces**)

IT **Polymers, processes**

RL: CPS (Chemical process); NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)

(graft, **brush, surface** anchored; Y-shaped

hydrophobic/hydrophilic polymer

brush micelles anchored on **silicon** forming nanoscale solvent-switchable **surfaces**)

IT **Surface structure**

(superstructure, switchable; Y-shaped **hydrophobic/**

hydrophilic polymer brush micelles anchored on **silicon** forming nanoscale solvent-switchable **surfaces**)

IT Superlattices

(**surface**, switchable; Y-shaped **hydrophobic/**

hydrophilic polymer brush micelles anchored on **silicon** forming nanoscale solvent-switchable **surfaces**)

IT 99-10-5D, 3,5-Dihydroxybenzoic acid, reaction products with carboxy-terminated polystyrene and with polyacrylic acid

RL: CPS (Chemical process); NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)

(anchoring compound; Y-shaped **hydrophobic/hydrophilic polymer brush** micelles anchored on **silicon** forming nanoscale solvent-switchable **surfaces**)

IT 7440-21-3D, **Silicon**, epoxysilane **surface** compds.
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(anchoring **substrate**; Y-shaped **hydrophobic/hydrophilic polymer brush** micelles anchored on **silicon** forming nanoscale solvent-switchable **surfaces**)

IT 25232-27-3D, Poly(tert-butyl acrylate), hydrolysis products, carboxy-terminated, reaction products with dihydroxybenzoic acid
RL: CPS (Chemical process); NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(**hydrophilic arm** in Y-**brush** micelles; Y-shaped **hydrophobic/hydrophilic polymer brush** micelles anchored on **silicon** forming nanoscale solvent-switchable **surfaces**)

IT 9003-53-6D, Polystyrene, carboxy-terminated, reaction products with dihydroxybenzoic acid
RL: CPS (Chemical process); NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(**hydrophobic arm** in Y-**brush** micelles; Y-shaped **hydrophobic/hydrophilic polymer brush** micelles anchored on **silicon** forming nanoscale solvent-switchable **surfaces**)

IT 108-88-3, Toluene, uses 7732-18-5, Water, uses
RL: NUU (Other use, unclassified); USES (Uses)
(switching solvent; Y-shaped **hydrophobic/hydrophilic polymer brush** micelles anchored on **silicon** forming nanoscale solvent-switchable **surfaces**)

REFERENCE COUNT: 48 THERE ARE 48 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L36 ANSWER 10 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2003:609949 HCAPLUS
DOCUMENT NUMBER: 139:146213
TITLE: Method of **immobilizing** biologically active molecules for assay purposes in a microfluidic format
INVENTOR(S): Robotti, Karla
PATENT ASSIGNEE(S): USA
SOURCE: U.S. Pat. Appl. Publ., 19 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|------|----------|------------------|------------|
| US 2003148291 | A1 | 20030807 | US 2002-72525 | 20020205 |
| DE 10256931 | A1 | 20030821 | DE 2002-10256931 | 20021205 |
| PRIORITY APPLN. INFO.: | | | US 2002-72525 | A 20020205 |

AB The invention provides biol. mols. entrapped within a sol-gel matrix and incorporated into a microanal. device for high throughput screening of samples. The pore sizes of the matrix may be chosen to match the size of the entrapped biol. mol. or to correspond in size with the sample mols. to be analyzed. The sol-gel may be formed into structures that can be incorporated into or onto the microanal. devices as microcolumns,

microchannels, and microarrays. The sol-gel may incorporate substituted silanes and thereby provide a **hydrophobic** or **hydrophilic** surface, thereby providing the potential for use in microchromatog., microelectrophoresis or combinations thereof on the microanal. device. A preferred detection method of samples is mass spectrometry. Sol-gel-entrapped trypsin was prepared using HCl, tetra-Me orthosilicate, and trypsin in ammonium bicarbonate buffer, p. 8.1. The entrapped trypsin was stable and active.

IC ICM C12Q001-68
ICS G01N033-53; G01N033-542; G01N033-552
NCL 435006000; 435007900; 436527000
CC 9-16 (Biochemical Methods)
ST **immobilization biomol** sol gel matrix microfluidic
assay; trypsin entrapment sol gel tetramethyl orthosilicate
IT Enzymes, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(aldase, **immobilization** of; **immobilizing** biol.
active mols. in sol-gel matrixes for microfluidic assays)
IT **Immobilization, molecular or cellular**
(antibody; **immobilizing** biol. active mols. in sol-gel
matrixes for microfluidic assays)
IT Analysis
Analytical apparatus
(biochem.; **immobilizing** biol. active mols. in sol-gel
matrixes for microfluidic assays)
IT Oxides (inorganic), reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(colloidal sols; **immobilizing** biol. active mols. in sol-gel
matrixes for microfluidic assays)
IT Cell
Membrane, biological
(fragments, **immobilization**; **immobilizing** biol.
active mols. in sol-gel matrixes for microfluidic assays)
IT Peptides, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(hormones, **immobilization**; **immobilizing** biol.
active mols. in sol-gel matrixes for microfluidic assays)
IT Blood-coagulation factors
Cytokines
Enzymes, reactions
Gene
Kinins (animal hormones)
Polynucleotides
Receptors
RL: RCT (Reactant); RACT (Reactant or reagent)
(**immobilization** of; **immobilizing** biol. active mols.
in sol-gel matrixes for microfluidic assays)
IT **Biochemical molecules**
Buffers
Capillary electrophoresis
Films
Fluorometry
High throughput screening
Hydrophilicity
Hydrophobicity
Immobilization, molecular or cellular
Mass spectrometry
Microarray technology
Particles

Raman spectroscopy
Refractive index
Samples
UV and visible spectroscopy
pH
 (**immobilizing** biol. active mols. in sol-gel matrixes for
 microfluidic assays)

IT Fibers
RL: TEM (Technical or engineered material use); USES (Uses)
 (**immobilizing** biol. active mols. in sol-gel matrixes for
 microfluidic assays)

IT Etching
Molding
 (in fabrication of microanal. device; **immobilizing** biol.
 active mols. in sol-gel matrixes for microfluidic assays)

IT Silanes
RL: TEM (Technical or engineered material use); USES (Uses)
 (in sol-gel; **immobilizing** biol. active mols. in sol-gel
 matrixes for microfluidic assays)

IT Porous materials
 (inorg. matrix, biomols. **immobilization** in;
 immobilizing biol. active mols. in sol-gel matrixes for
 microfluidic assays)

IT Proteins
RL: RCT (Reactant); RACT (Reactant or reagent)
 (membrane, solubilized, **immobilization**; **immobilizing**
 biol. active mols. in sol-gel matrixes for microfluidic assays)

IT Liquid chromatography
 (microchromatog.; **immobilizing** biol. active mols. in sol-gel
 matrixes for microfluidic assays)

IT Electrophoresis
 (microelectrophoresis; **immobilizing** biol. active mols. in
 sol-gel matrixes for microfluidic assays)

IT Fluids
 (microfluids; **immobilizing** biol. active mols. in sol-gel
 matrixes for microfluidic assays)

IT Lithography
 (microlithog., in fabrication of microanal. device;
 immobilizing biol. active mols. in sol-gel matrixes for
 microfluidic assays)

IT Silicates, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
 (mixed with acidified oxide, in sol-gel preparation; **immobilizing**
 biol. active mols. in sol-gel matrixes for microfluidic assays)

IT IR spectroscopy
 (near-IR; **immobilizing** biol. active mols. in sol-gel matrixes
 for microfluidic assays)

IT Pore size
 (of matrix; **immobilizing** biol. active mols. in sol-gel
 matrixes for microfluidic assays)

IT Hormones, animal, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
 (peptide, **immobilization**; **immobilizing** biol. active
 mols. in sol-gel matrixes for microfluidic assays)

IT Sol-gel processing
 (polymerization; **immobilizing** biol. active mols. in sol-gel matrixes
 for microfluidic assays)

IT Micromachining
 (silicon, in fabrication of microanal. device; **immobilizing**

- biol. active mols. in sol-gel matrixes for microfluidic assays)
- IT Gels
Sols
(sol-gel matrix; **immobilizing** biol. active mols. in sol-gel matrixes for microfluidic assays)
- IT Polymerization
(sol-gel; **immobilizing** biol. active mols. in sol-gel matrixes for microfluidic assays)
- IT 1066-33-7, Ammonium bicarbonate
RL: NUU (Other use, unclassified); USES (Uses)
(buffer; **immobilizing** biol. active mols. in sol-gel matrixes for microfluidic assays)
- IT 9000-81-1, Acetylcholinesterase 9000-92-4, Amylase 9000-95-7, Apyrase 9000-96-8, Arginase 9001-01-8, Kallikrein 9001-03-0, Anhydrase 9001-05-2, Catalase 9001-08-5, Cholinesterase 9001-42-7, Maltase 9001-51-8, Hexokinase 9001-54-1, Hyaluronidase 9001-57-4, Invertase 9001-62-1, Lipase 9001-63-2, Lysozyme 9001-73-4, Papain 9001-75-6, Pepsin 9001-99-4, RNase 9002-05-5, Blood coagulation factor, Xa 9002-06-6, Thymidine kinase 9002-07-7, Trypsin 9002-10-2, Tyrosinase 9003-98-9, DNase 9003-99-0, Peroxidase 9004-06-2, Elastase 9004-07-3, Chymotrypsin 9012-54-8, Cellulase 9012-56-0, Amidase 9013-05-2, Phosphatase 9013-19-8, Isomerase 9013-79-0, Esterase 9014-01-1, Subtilisin 9015-68-3, Asparaginase 9015-94-5, Renin, reactions 9025-26-7, Cathepsin D 9025-70-1, Dextranase 9025-82-5, Phosphodiesterase 9026-81-7, Nuclease 9026-93-1, Adenosine deaminase 9027-05-8, Hydrogenase 9027-30-9, Aspartase 9027-41-2, Hydrolase 9028-00-6, Clostripain 9031-11-2, Lactase 9031-44-1, Kinase 9031-55-4, Carboxylase 9031-56-5, Ligase 9031-66-7, Aminotransferase 9031-94-1, Aminopeptidase 9031-96-3, Peptidase 9031-98-5, Carboxypeptidase 9032-68-2, Cathepsin C 9032-75-1, Pectinase 9032-88-6, Fumarase 9032-92-2, Glycosidase 9033-06-1, Glucosidase 9035-73-8, Oxidase 9035-82-9, Dehydrogenase 9037-21-2, Tryptophan hydroxylase 9037-29-0, Oxygenase 9037-80-3, Reductase 9039-53-6, Urokinase 9047-22-7, Cathepsin B 9047-61-4, Transferase 9054-89-1, Superoxide dismutase 9055-15-6, Oxidoreductase 9067-84-9, Deaminase 9068-31-9, Naringinase 9073-78-3, Thermolysin 9075-21-2, Pyroglutamate aminopeptidase 37228-64-1, Glucocerebrosidase 39450-01-6, Proteinase K 55576-49-3, Endoproteinase Asp N 56645-49-9, Cathepsin G 60118-07-2, Endorphin 73562-30-8, Acylamino acid releasing enzyme 120178-12-3, Telomerase 123175-81-5, Endoproteinase Arg C 123175-82-6, Endoproteinase Lys C 137010-42-5 139639-23-9, Tissue plasminogen activator 150977-36-9, Bromelain 375798-61-1, Phosphatase, phosphoprotein
RL: RCT (Reactant); RACT (Reactant or reagent)
(**immobilization** of; **immobilizing** biol. active mols. in sol-gel matrixes for microfluidic assays)
- IT 7647-01-0, Hydrochloric acid, uses
RL: NUU (Other use, unclassified); USES (Uses)
(**immobilizing** biol. active mols. in sol-gel matrixes for microfluidic assays)
- IT 78-10-4, Tetraethyl orthosilicate 681-84-5, Tetramethyl orthosilicate
RL: RCT (Reactant); RACT (Reactant or reagent)
(**immobilizing** biol. active mols. in sol-gel matrixes for microfluidic assays)
- IT 7440-21-3, Silicon, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(micromachining, in fabrication of microanal. device; **immobilizing** biol. active mols. in sol-gel matrixes for microfluidic assays)

IT 1344-09-8, Sodium silicate
RL: RCT (Reactant); RACT (Reactant or reagent)
(mixed with acidified oxide, in sol-gel preparation; immobilizing
biol. active mols. in sol-gel matrixes for microfluidic assays)

IT 9001-92-7, Protease
RL: RCT (Reactant); RACT (Reactant or reagent)
(protease, immobilization of; immobilizing biol.
active mols. in sol-gel matrixes for microfluidic assays)

L36 ANSWER 11 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2003:457094 HCAPLUS
DOCUMENT NUMBER: 140:164588
TITLE: Block copolymer brushes as materials for producing
surfaces with smart adhesion behavior
AUTHOR(S): Viswanathan, Kalpana; Williamson, David T.; Elkins,
Casey L.; Long, Timothy E.; Ward, Thomas C.
CORPORATE SOURCE: Department of Chemistry, Virginia Polytechnic
Institute and State University, Blacksburg, VA, 24061,
USA
SOURCE: Proceedings of the Annual Meeting of the Adhesion
Society (2003), 26th, 161-163
CODEN: PAMSFE; ISSN: 1086-9506
PUBLISHER: Adhesion Society
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Central functionalized asym. triblock copolymers were used to generate
surfaces that can exhibit reversible wetting properties promoted by
external stimulus aided conformational rearrangements of the polymer
chains, and compared with a series of polystyrene. Initial studies on
hydroxyethyl-terminated poly(1,3-cyclohexadiene) (PCHD) as well as
hydroxyl- and triethoxysilyl-terminated polystyrene are presented. The
scanning electron micrograph of the PCHD coated surfaces showed that the
polymer dewetted the silicon surface on annealing and most of it was
washed off during solvent extraction. Hydroxyl terminated PCHD and polystyrene
were unstable under demanding conditions, which necessitates the use of
chemical grafting techniques for forming the brush. A series of polystyrene
failed to show good adhesion to silicon surfaces. This behavior of the
hydrophilic surface could be reversed by modifying the surface
with polymer brushes to display favorable interaction
with such hydrophobic polymers.

CC 37-5 (Plastics Manufacture and Processing)
IT 7440-21-3, Silicon, properties
RL: PRP (Properties)
(substrate; adhesion of hydroxyl-terminated
poly(cyclohexadiene) and polystyrene on silicon)

REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L36 ANSWER 12 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2003:282035 HCAPLUS
DOCUMENT NUMBER: 138:300113
TITLE: Label-free methods for performing assays using a
colorimetric resonant reflectance optical biosensor
INVENTOR(S): Lin, Bo; Pepper, Jane; Cunningham, Brian T.;
Gerstenmaier, John; Li, Peter; Qiu, Jean; Pien, Homer
PATENT ASSIGNEE(S): SRU Biosystems LLC, USA
SOURCE: U.S. Pat. Appl. Publ., 65 pp., Cont.-in-part of U.S.
Ser. No. 227,908.
CODEN: USXXCO

DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 15
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|------|----------|-----------------|-------------|
| US 2003068657 | A1 | 20030410 | US 2002-237641 | 20020909 |
| US 2002127565 | A1 | 20020912 | US 2001-930352 | 20010815 |
| US 2003210396 | A1 | 20031113 | US 2001-1069 | 20011030 |
| US 2003027327 | A1 | 20030206 | US 2002-58626 | 20020128 |
| US 2003027328 | A1 | 20030206 | US 2002-59060 | 20020128 |
| US 2003032039 | A1 | 20030213 | US 2002-180647 | 20020626 |
| US 2003059855 | A1 | 20030327 | US 2002-180374 | 20020626 |
| US 2003113766 | A1 | 20030619 | US 2002-227908 | 20020826 |
| US 2004132214 | A1 | 20040708 | US 2003-667696 | 20030922 |
| PRIORITY APPLN. INFO.: | | | US 2000-244312P | P 20001030 |
| | | | US 2001-283314P | P 20010412 |
| | | | US 2001-303028P | P 20010703 |
| | | | US 2001-930352 | A2 20010815 |
| | | | US 2002-58626 | A2 20020128 |
| | | | US 2002-59060 | A2 20020128 |
| | | | US 2002-180374 | A2 20020626 |
| | | | US 2002-180647 | A2 20020626 |
| | | | US 2002-227908 | A2 20020826 |
| | | | US 2001-310399P | P 20010806 |
| | | | JP 2001-299942 | A 20010928 |
| | | | US 2002-52626 | A2 20020117 |
| | | | US 2002-237641 | A2 20020909 |

AB Methods are provided for detecting **biomol.** interactions. The use of labels is not required and the methods can be performed in a high-throughput manner. The invention also relates to optical devices. Biosensors were used to detect protein-protein interactions, DNA-DNA interactions, protein-DNA interactions, growth of cells, interleukin 1 release from macrophages, etc.

IC ICM G01N033-53
 ICS G01N033-542; C12M001-34

NCL 435007900; 435287200

CC 9-1 (Biochemical Methods)

Section cross-reference(s): 3, 6, 15

IT Functional groups
 (acidic groups, specific binding substance **immobilization** onto surface of biosensor via; label-free methods for performing assays using colorimetric resonant reflectance optical biosensors)

IT Functional groups
 (alkoxycarbonyl groups, specific binding substance **immobilization** onto surface of biosensor via; label-free methods for performing assays using colorimetric resonant reflectance optical biosensors)

IT Molecular association
 (**biomol.**, detection of; label-free methods for performing assays using colorimetric resonant reflectance optical biosensors)

IT Chemisorption
 (electrochem., specific binding substance **immobilization** onto surface of biosensor by; label-free methods for performing assays using colorimetric resonant reflectance optical biosensors)

IT Functional groups
 (ether groups, specific binding substance **immobilization** onto surface of biosensor via; label-free methods for performing assays

- using colorimetric resonant reflectance optical biosensors)
- IT **Glass substrates**
(for biosensor; label-free methods for performing assays using colorimetric resonant reflectance optical biosensors)
- IT **Bond**
(**hydrophilic**, specific binding substance **immobilization** onto surface of biosensor by; label-free methods for performing assays using colorimetric resonant reflectance optical biosensors)
- IT **Bond**
(**hydrophobic**, specific binding substance **immobilization** onto surface of biosensor by; label-free methods for performing assays using colorimetric resonant reflectance optical biosensors)
- IT **Antibodies and Immunoglobulins**
RL: ARG (Analytical reagent use); BSU (Biological study, unclassified); DEV (Device component use); TEM (Technical or engineered material use); ANST (Analytical study); BIOL (Biological study); USES (Uses)
(**immobilized**; label-free methods for performing assays using colorimetric resonant reflectance optical biosensors)
- IT **Bond**
(**ionic**, specific binding substance **immobilization** onto surface of biosensor by; label-free methods for performing assays using colorimetric resonant reflectance optical biosensors)
- IT **Biochemical molecules**
Blood analysis
Cell
Combinatorial library
Eubacteria
High throughput screening
Human
Hydrogels
Immunoassay
Nucleic acid hybridization
Protein microarray technology
Virus
(label-free methods for performing assays using colorimetric resonant reflectance optical biosensors)
- IT **Immobilization, molecular or cellular**
(of specific binding substance onto surface of biosensor; label-free methods for performing assays using colorimetric resonant reflectance optical biosensors)
- IT **Adsorption**
Chemisorption
(specific binding substance **immobilization** onto surface of biosensor by; label-free methods for performing assays using colorimetric resonant reflectance optical biosensors)
- IT **Alkyl groups**
Amide group
Amino group
Aryl groups
Carbonyl group
Cyano group
Formyl group
Hydroxyl group
Phosphate group
Sulfhydryl group
(specific binding substance **immobilization** onto surface of biosensor via; label-free methods for performing assays using

- colorimetric resonant reflectance optical biosensors)
- IT Alkenes, analysis
Alkynes
Amino acids, analysis
Carbohydrates, analysis
Lipids, analysis
Phospholipids, analysis
Steroids, analysis
RL: ARU (Analytical role, unclassified); DEV (Device component use); RCT (Reactant); TEM (Technical or engineered material use); ANST (Analytical study); RACT (Reactant or reagent); USES (Uses)
(specific binding substance **immobilization** onto surface of biosensor via; label-free methods for performing assays using colorimetric resonant reflectance optical biosensors)
- IT 919-30-2, 3-Aminopropyltriethoxysilane
RL: DEV (Device component use); RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(**glass substrate** coating with; label-free methods for performing assays using colorimetric resonant reflectance optical biosensors)
- IT 443965-78-4
RL: ARG (Analytical reagent use); RCT (Reactant); ANST (Analytical study); RACT (Reactant or reagent); USES (Uses)
(**immobilization** of, for caspase 3 inhibitor assay; label-free methods for performing assays using colorimetric resonant reflectance optical biosensors)
- IT 183613-14-1
RL: NUU (Other use, unclassified); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(**immobilization** of, to prevent nonspecific binding of proteins to biosensor; label-free methods for performing assays using colorimetric resonant reflectance optical biosensors)
- IT 207400-85-9
RL: ARG (Analytical reagent use); RCT (Reactant); ANST (Analytical study); RACT (Reactant or reagent); USES (Uses)
(**immobilization** of; label-free methods for performing assays using colorimetric resonant reflectance optical biosensors)
- IT 9013-20-1D, Streptavidin, complexes with biosensor-**immobilized** biotin
RL: ARG (Analytical reagent use); BSU (Biological study, unclassified); DEV (Device component use); TEM (Technical or engineered material use); ANST (Analytical study); BIOL (Biological study); USES (Uses)
(label-free methods for performing assays using colorimetric resonant reflectance optical biosensors)
- IT 9003-53-6, Polystyrene
RL: DEV (Device component use); RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(microtiter plate **substrate**; label-free methods for performing assays using colorimetric resonant reflectance optical biosensors)
- IT 7440-02-0D, Nickel, group
RL: ARU (Analytical role, unclassified); DEV (Device component use); RCT (Reactant); TEM (Technical or engineered material use); ANST (Analytical study); RACT (Reactant or reagent); USES (Uses)
(specific binding substance **immobilization** onto surface of biosensor via; label-free methods for performing assays using colorimetric resonant reflectance optical biosensors)

L36 ANSWER 13 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2003:221926 HCAPLUS
 DOCUMENT NUMBER: 138:251070
 TITLE: Device with chemical surface patterns
 INVENTOR(S): Textor, Marcus; Michel, Roger; Voeroes, Janos;
 Hubbell, Jeffrey A.; Lussi, Jost
 PATENT ASSIGNEE(S): Eidgenoessische Technische Hochschule Zuerich, Switz.
 SOURCE: PCT Int. Appl., 69 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|--|------|----------|-----------------|----------|
| WO 2003023401 | A1 | 20030320 | WO 2001-CH548 | 20010912 |
| W: | | | | |
| AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, VZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU | | | | |
| RW: | | | | |
| GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG | | | | |
| EP 1425583 | A1 | 20040609 | EP 2001-960055 | 20010912 |
| R: | | | | |
| AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR | | | | |

PRIORITY APPLN. INFO.: WO 2001-CH548 W 20010912
 AB The invention concerns a device with chemical surface patterns (defined surface areas of at least two different chemical compns.) with biochem. or biol. relevance on **substrates** with prefabricated patterns of at least two different types of regions (α , β , ...), whereas at least two different, consecutively applied mol. self-assembly systems (A, B...) are used in a way that at least one of the applied assembly systems (A or B or...) is specific to one type of the prefabricated patterns (α or β or...). A silicon wafer was coated with TiO₂ followed by SiO₂ and a pattern of 5 X 5 squares of TiO₂ was etched through the SiO₂ layer. The patterned surface was dipped in aqueous ammonium dodecyl phosphate for self-assembly of DDP on top of the TiO₂ areas, rendering these areas highly **hydrophobic**. The surface was dipped in an aqueous solution of poly(L-lysine)-g-poly(ethylene glycol) (PLL-g-PEG) to selectively adsorbed to the SiO₂ regions. Texas Red-streptavidin selectively adsorbed to the PLL-g-PEG coating.
 IC ICM G01N033-543
 ICS A61L029-08; A61L027-34; A61L031-10; A61L027-28
 CC 9-1 (Biochemical Methods)
 ST device surface pattern biochem **substrate** prepattern; self assembly dodecyl phosphate titanium oxide; polylysine PEG selective adsorption silicon oxide; protein selective adsorption patterned surface
 IT Prion proteins
 RL: ANT (Analyte); DGN (Diagnostic use); ANST (Analytical study); BIOL (Biological study); USES (Uses)
 (PrPSc; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)
 IT Animal tissue
 Body fluid
 Egg yolk

Lymph

Plant tissue

Waters

(anal. of; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT Nucleic acids

RL: ANT (Analyte); ARG (Analytical reagent use); BSU (Biological study, unclassified); DEV (Device component use); TEM (Technical or engineered material use); ANST (Analytical study); BIOL (Biological study); USES (Uses)

(analog; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT Joint, anatomical

(ankle, artificial; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT Joint, anatomical

(artificial, components; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT Hip

(artificial; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT Radioactive substances

(as labels; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT Analytical apparatus

(biochem.; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT Chemicals

(biochems.; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT Integrins

RL: BSU (Biological study, unclassified); BIOL (Biological study)
(biomedical device with cell adhesion patterns interacting with; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT Polymers, reactions

RL: DEV (Device component use); RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(block, diblock, self-assembly on prepatterned surfaces; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT Polymers, reactions

RL: DEV (Device component use); RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(block, self-assembly on prepatterned surfaces; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT Medical goods

(bone cements, endoprosthesis used in combination with; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT Prosthetic materials and Prosthetics

(cardiovascular implants; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT Medical goods

(catheters; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT Polyelectrolytes

(cationic, copolymers, selective assembly on prepatterned surfaces;

device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT Epithelium
(cells of, in biomedical device; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT Polymers, reactions
RL: DEV (Device component use); RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(co-, polycationic, selective assembly on prepatterned surfaces; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT Metals, uses
RL: ARG (Analytical reagent use); DEV (Device component use); TEM (Technical or engineered material use); ANST (Analytical study); USES (Uses)
(colloids, as labels; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT Albumins, biological studies
RL: BSU (Biological study, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); BIOL (Biological study); PROC (Process)
(conjugates with Oregon Green, selective adsorption on patterned silicon wafer; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT Adsorption
Desorption
(detection of change in refractive index due to; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT Refractive index
(detection of change in; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT Eubacteria
Pathogen
Salmonella
(determination of; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT Adhesion, biological
Agrochemicals
Animal
Animal tissue culture
Apparatus
Aptamers
Bioassay
Biosensors
Blood analysis
Cell
Cell differentiation
Cell morphology
Cell proliferation
Chelating agents
Combinatorial chemistry
Cytoskeleton
Diagnosis
Diffraction gratings
Drug screening
Environmental analysis
Evanescent wave
Fluorescence microscopy

Food analysis

Human

Immobilization, molecular or cellular

Luminescent substances

Medical goods

Molecular association

Optical waveguides

Pharmaceutical analysis

Plant analysis

Soil analysis

Spin labels

Surface

Urine analysis

Veterinary medicine

(device with chemical surface patterns with biochems. on

substrates with prefabricated patterns)

IT Agglutinins and Lectins

Antibodies and Immunoglobulins

Antigens

DNA

Enzymes, analysis

Glycopeptides

Nucleic acids

Oligonucleotides

Oligosaccharides, analysis

Peptide nucleic acids

Polynucleotides

RNA

RL: ANT (Analyte); ARG (Analytical reagent use); BSU (Biological study, unclassified); DEV (Device component use); TEM (Technical or engineered material use); ANST (Analytical study); BIOL (Biological study); USES (Uses)

(device with chemical surface patterns with biochems. on

substrates with prefabricated patterns)

IT Ligands

RL: ANT (Analyte); ARG (Analytical reagent use); DEV (Device component use); TEM (Technical or engineered material use); ANST (Analytical study); USES (Uses)

(device with chemical surface patterns with biochems. on

substrates with prefabricated patterns)

IT Proteins

RL: ANT (Analyte); BSU (Biological study, unclassified); MSC (Miscellaneous); ANST (Analytical study); BIOL (Biological study)

(device with chemical surface patterns with biochems. on

substrates with prefabricated patterns)

IT Acrylic polymers, uses

Glass, uses

Polycarbonates, uses

Polyimides, uses

Silicates, uses

RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)

(device with chemical surface patterns with biochems. on

substrates with prefabricated patterns)

IT Blood vessel

(devices; device with chemical surface patterns with biochems. on

substrates with prefabricated patterns)

IT Luminescent substances

(dyes, as label; device with chemical surface patterns with biochems. on

- substrates** with prefabricated patterns)
- IT Joint, anatomical
(elbow, artificial; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)
- IT Prosthetic materials and Prosthetics
(endoprosthetic; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)
- IT Blood vessel
(endothelium, cells of, in biomedical device; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)
- IT Extracellular matrix
(expression of factors to; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)
- IT Hand
(finger, artificial; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)
- IT Bone, disease
(fracture, prosthetics for fixing; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)
- IT Antibodies and Immunoglobulins
RL: ARG (Analytical reagent use); BSU (Biological study, unclassified); DEV (Device component use); TEM (Technical or engineered material use); ANST (Analytical study); BIOL (Biological study); USES (Uses)
(fragments; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)
- IT Polymers, reactions
RL: DEV (Device component use); RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(graft, with PEG, selective coating on prepatterned surfaces by electrostatic interactions at specific pH; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)
- IT Polyoxyalkylenes, reactions
RL: DEV (Device component use); RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(grafted polymers, selective coating on prepatterned surfaces by electrostatic interactions at specific pH; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)
- IT Cell membrane
(**immobilized** peptide or protein interacting with receptors in; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)
- IT Receptors
RL: BSU (Biological study, unclassified); BIOL (Biological study)
(**immobilized** peptide or protein interacting with, in cell membranes; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)
- IT Peptides, biological studies
Proteins
RL: ARG (Analytical reagent use); BSU (Biological study, unclassified); DEV (Device component use); TEM (Technical or engineered material use); ANST (Analytical study); BIOL (Biological study); USES (Uses)
(**immobilized**; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)
- IT Dental materials and appliances
Prosthetic materials and Prosthetics
(implants; device with chemical surface patterns with biochems. on

substrates with prefabricated patterns)

IT Fibroblast
Macrophage
Osteoblast
Osteoclast
(in biomedical device; device with chemical surface patterns with
biochems. on **substrates** with prefabricated patterns)

IT pH
(in selective coating of PEG-grafted polymers on prepatterned surfaces
by electrostatic interactions; device with chemical surface patterns with
biochems. on **substrates** with prefabricated patterns)

IT Joint, anatomical
(knee, artificial; device with chemical surface patterns with biochems. on
substrates with prefabricated patterns)

IT ESR (electron spin resonance)
NMR spectroscopy
(labels for; device with chemical surface patterns with biochems. on
substrates with prefabricated patterns)

IT Mass
(labels; device with chemical surface patterns with biochems. on
substrates with prefabricated patterns)

IT Materials
(layered; device with chemical surface patterns with biochems. on
substrates with prefabricated patterns)

IT Dyes
(luminescent, as label; device with chemical surface patterns with
biochems. on **substrates** with prefabricated patterns)

IT Prosthetic materials and Prosthetics
(maxillofacial; device with chemical surface patterns with biochems. on
substrates with prefabricated patterns)

IT Plastics, uses
RL: DEV (Device component use); TEM (Technical or engineered material
use); USES (Uses)
(moldable; device with chemical surface patterns with biochems. on
substrates with prefabricated patterns)

IT Antibodies and Immunoglobulins
RL: ARG (Analytical reagent use); BSU (Biological study, unclassified);
DEV (Device component use); TEM (Technical or engineered material use);
ANST (Analytical study); BIOL (Biological study); USES (Uses)
(monoclonal; device with chemical surface patterns with biochems. on
substrates with prefabricated patterns)

IT Fasteners
(nails; device with chemical surface patterns with biochems. on
substrates with prefabricated patterns)

IT Nerve
(neuron, in biomedical device; device with chemical surface patterns with
biochems. on **substrates** with prefabricated patterns)

IT Biochemical molecules
(nonspecific adsorption of; device with chemical surface patterns with
biochems. on **substrates** with prefabricated patterns)

IT Self-assembly
(of alkane phosphates or alkane phosphonates on prepatterned surfaces;
device with chemical surface patterns with biochems. on **substrates**
with prefabricated patterns)

IT Hydrophilicity
Hydrophobicity
(of areas of prepatterned surfaces; device with chemical surface patterns
with biochems. on **substrates** with prefabricated patterns)

IT Isoelectric point

- (of oxide, nitride, or carbide areas; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)
- IT Stem cell
(osteogeneic, in biomedical device; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)
- IT Plates
Screws
(osteosynthesis; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)
- IT Self-assembled monolayers
(patterns of; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)
- IT Carbides
Nitrides
Oxides (inorganic), reactions
Transition metal oxides
RL: DEV (Device component use); RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(phosphate- or phosphonate-interacting prefabricated patterns of; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)
- IT Medical goods
(pins; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)
- IT Cell
(polynuclear, patterns of adsorbed macrophages on biomed. device not nucleating into; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)
- IT Bone formation
(precursor cells, in biomedical device; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)
- IT Adsorption
(protein, nonspecific; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)
- IT Affinity
(screening; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)
- IT Electrostatic deposition
(selective, of PEG-grafted polymers on prepatterned surfaces; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)
- IT Phosphates, reactions
RL: DEV (Device component use); RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(self-assembly on prepatterned surfaces; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)
- IT Surface plasmon
(sensor; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)
- IT Joint, anatomical
(shoulder, artificial; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)
- IT Muscle
(smooth, cells of, in biomedical device; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT Medical goods
(stents; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT Organelle
(stress fiber, formation of; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT Toxicity
(studies of; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT Ceramics
Composites
(**substrate** of; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT Alloys, uses
Polymers, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(**substrate** of; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT Spinal column
(surgery device; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT Plastics, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(thermoplastics; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT Silylation
(to make **hydrophobic** areas; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT Heart
(valve, artificial; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT Joint, anatomical
(wrist, artificial; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT 9005-49-6, Heparin, biological studies
RL: BSU (Biological study, unclassified); BIOL (Biological study)
(biomedical device with cell adhesion patterns interacting with; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT 7365-45-9, HEPES
RL: NUU (Other use, unclassified); USES (Uses)
(buffer; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT 58-85-5D, Biotin, conjugates
RL: ARG (Analytical reagent use); BSU (Biological study, unclassified); DEV (Device component use); TEM (Technical or engineered material use); ANST (Analytical study); BIOL (Biological study); USES (Uses)
(device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT 199869-49-3D, ethoxylated polylysine derivs.
RL: ARU (Analytical role, unclassified); DEV (Device component use); RCT (Reactant); TEM (Technical or engineered material use); ANST (Analytical study); RACT (Reactant or reagent); USES (Uses)
(device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT 9013-20-1, Streptavidin

RL: BSU (Biological study, unclassified); BIOL (Biological study)
(device with chemical surface patterns with biochems. on
substrates with prefabricated patterns)

IT 1314-13-2, Zinc oxide, reactions 12055-23-1, Hafnium oxide (HfO2)
RL: DEV (Device component use); RCT (Reactant); TEM (Technical or
engineered material use); RACT (Reactant or reagent); USES (Uses)
(device with chemical surface patterns with biochems. on
substrates with prefabricated patterns)

IT 9003-53-6, Polystyrene 9011-14-7, Polymethylmethacrylate
RL: DEV (Device component use); TEM (Technical or engineered material
use); USES (Uses)
(device with chemical surface patterns with biochems. on
substrates with prefabricated patterns)

IT 151754-91-5
RL: ARU (Analytical role, unclassified); DEV (Device component use); TEM
(Technical or engineered material use); ANST (Analytical study); USES
(Uses)
(for blocking protein binding to silicon dioxide regions of silicon
wafer; device with chemical surface patterns with biochems. on
substrates with prefabricated patterns)

IT 7440-22-4, Silver, uses 7440-57-5, Gold, uses 14808-60-7, Quartz, uses
RL: DEV (Device component use); TEM (Technical or engineered material
use); USES (Uses)
(in bioanal. sensing platform; device with chemical surface patterns with
biochems. on **substrates** with prefabricated patterns)

IT 99896-85-2D, **immobilized** 123063-31-0D, **immobilized**
134580-64-6D, **immobilized** 193613-75-1D, **immobilized**
359878-44-7D, **immobilized** 393153-52-1D, **immobilized**
502453-68-1D, **immobilized** 502453-69-2D, **immobilized**
502453-70-5D, **immobilized** 502453-71-6D, **immobilized**
502453-72-7D, **immobilized** 502453-73-8D, **immobilized**
502453-74-9D, **immobilized** 502453-75-0D, **immobilized**
502453-76-1D, **immobilized** 502453-77-2D, **immobilized**
502453-78-3D, **immobilized** 502453-79-4D, **immobilized**
502453-80-7D, **immobilized** 502453-81-8D, **immobilized**
502453-82-9D, **immobilized** 502453-83-0D, **immobilized**
502453-84-1D, **immobilized** 502453-85-2D, **immobilized**
502453-86-3D, **immobilized** 502453-87-4D, **immobilized**
502453-88-5D, **immobilized** 502453-89-6D, **immobilized**
502453-90-9D, **immobilized** 502453-91-0D, **immobilized**
502453-92-1D, **immobilized** 502453-93-2D, **immobilized**
502453-94-3D, **immobilized** 502453-95-4D, **immobilized**
502453-96-5D, **immobilized** 502453-97-6D, **immobilized**
502453-98-7D, **immobilized** 502453-99-8D, **immobilized**
502454-00-4D, **immobilized** 502454-01-5D, **immobilized**
502454-02-6D, **immobilized** 502454-03-7D, **immobilized**
502454-04-8D, **immobilized** 502454-05-9D, **immobilized**
502454-06-0D, **immobilized** 502454-07-1D, **immobilized**
502454-08-2D, **immobilized** 502454-09-3D, **immobilized**
502454-10-6D, **immobilized** 502454-11-7D, **immobilized**
502454-12-8D, **immobilized** 502454-13-9D, **immobilized**
502454-14-0D, **immobilized** 502454-15-1D, **immobilized**
502454-16-2D, **immobilized** 502454-17-3D, **immobilized**
502454-18-4D, **immobilized** 502454-19-5D, **immobilized**
502454-20-8D, **immobilized** 502454-21-9D, **immobilized**
502454-22-0D, **immobilized** 502454-23-1D, **immobilized**
502454-24-2D, **immobilized** 502454-25-3D, **immobilized**
502454-26-4D, **immobilized** 502454-27-5D, **immobilized**
502454-28-6D, **immobilized** 502454-29-7D, **immobilized**

502454-30-0D, immobilized 502454-31-1D, immobilized
 502454-32-2D, immobilized 502454-33-3D, immobilized
 502454-34-4D, immobilized 502454-35-5D, immobilized
 502454-36-6D, immobilized 502454-37-7D, immobilized
 502454-38-8D, immobilized 502454-39-9D, immobilized
 502454-40-2D, immobilized 502454-41-3D, immobilized
 502454-42-4D, immobilized 502454-43-5D, immobilized
 502454-44-6D, immobilized 502454-45-7D, immobilized
 502454-46-8D, immobilized 502454-47-9D, immobilized
 502454-48-0D, immobilized 502454-49-1D, immobilized
 502454-50-4D, immobilized 502454-51-5D, immobilized
 502454-52-6D, immobilized 502454-53-7D, immobilized
 502454-54-8D, immobilized 502454-55-9D, immobilized
 502454-56-0D, immobilized 502454-57-1D, immobilized
 502454-58-2D, immobilized 502454-59-3D, immobilized
 502454-60-6D, immobilized 502454-61-7D, immobilized
 502454-62-8D, immobilized 502454-63-9D, immobilized
 502454-64-0D, immobilized 502454-65-1D, immobilized
 502454-66-2D, immobilized 502454-67-3D, immobilized
 502454-68-4D, immobilized 502454-69-5D, immobilized
 502454-70-8D, immobilized 502454-71-9D, immobilized
 502454-72-0D, immobilized 502454-73-1D, immobilized
 502454-74-2D, immobilized 502454-75-3D, immobilized
 502454-76-4D, immobilized 502454-77-5D, immobilized
 502454-78-6D, immobilized 502454-79-7D, immobilized
 502454-80-0D, immobilized 502454-81-1D, immobilized

RL: BSU (Biological study, unclassified); DEV (Device component use); PRP (Properties); TEM (Technical or engineered material use); BIOL (Biological study); USES (Uses)

(in patterns in biomed. device; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT 1313-96-8, Niobium oxide 1314-23-4, Zirconium oxide, reactions
 1314-61-0, Tantalum oxide 13463-67-7, Titanium oxide, reactions

RL: DEV (Device component use); RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)

(phosphate- or phosphonate-interacting prefabricated patterns of; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT 7631-86-9, Silicon oxide, uses

RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)

(prefabricated patterns of; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT 195136-58-4D, conjugates with albumin

RL: BSU (Biological study, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); BIOL (Biological study); PROC (Process)

(selective adsorption on patterned silicon wafer; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT 9013-20-1D, Streptavidin, conjugates with Texas Red 82354-19-6D, Texas Red, conjugates with streptavidin

RL: BSU (Biological study, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); RCT (Reactant); BIOL (Biological study); PROC (Process); RACT (Reactant or reagent)

(selective adsorption on patterned silicon wafer; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT 25322-68-3D, Polyethylene glycol, grafted polymers

RL: DEV (Device component use); RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses) (selective coating on prepatterned surfaces by electrostatic interactions at specific pH; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT 106392-12-5D, di- or multi-block

RL: DEV (Device component use); RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses) (self-assembly on prepatterned surfaces, protein resistance to **hydrophobic** surfaces in relation to; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT 15477-76-6D, Phosphonate, alkane

RL: DEV (Device component use); RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses) (self-assembly on prepatterned surfaces; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT 65138-75-2, Ammonium dodecyl phosphate

RL: DEV (Device component use); RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses) (self-assembly on titanium oxide regions of silicon wafer; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

IT 7440-21-3, Silicon, reactions

RL: DEV (Device component use); RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses) (wafer as **substrate**; device with chemical surface patterns with biochems. on **substrates** with prefabricated patterns)

REFERENCE COUNT: 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L36 ANSWER 14 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2003:118476 HCAPLUS

DOCUMENT NUMBER: 138:149902

TITLE: Latex based adsorbent chip and its preparation and use in (bio)assays

INVENTOR(S): Pohl, Christopher A.; Papanu, Steven C.

PATENT ASSIGNEE(S): CIPHERGEN BIOSYSTEMS, INC., USA

SOURCE: U.S. Pat. Appl. Publ., 39 pp., Cont.-in-part of U. S. Ser. No. 908,518.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 2

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|------|----------|-----------------|-------------|
| US 2003032043 | A1 | 20030213 | US 2002-197115 | 20020716 |
| US 2003017464 | A1 | 20030123 | US 2001-908518 | 20010717 |
| PRIORITY APPLN. INFO.: | | | US 2001-908518 | A2 20010717 |
| | | | US 2002-383008P | P 20020523 |

AB The present invention provides an adsorbent chip, which includes three components, a **substrate**, an intermediate layer of linker arms and an adsorbent film, which is attached to the linker arms. The adsorbent film is made up of a plurality of adsorbent particles, each of which includes a binding functionality. The invention also provides a method of making the chips of the invention in which the **substrate**

-intermediate film cassette is formed and the adsorbent film is subsequently **immobilized** thereon. When the adsorbent film is from the same preparation across a particular batch of chips, the chips provide for the acquisition of data that are highly reproducible from one chip to the next throughout the particular batch of chips. Addnl., the invention provides methods for using the chips to perform assays.

- IC ICM C12Q001-68
ICS G01N033-53; G01N033-542; C12M001-34
- NCL 435006000; 435007900; 435287200
- CC 9-1 (Biochemical Methods)
Section cross-reference(s): 79, 80
- IT Electric charge
 - Hydrophobicity**
 - Polarity
 - (as binding function on adsorbent particle film; latex based adsorbent chip and its preparation and use in (bio)assays)
- IT Amino group
 - Biochemical molecules**
 - Chelating agents
 - Drugs
 - Functional groups
 - (as binding groups on adsorbent film; latex based adsorbent chip and its preparation and use in (bio)assays)
- IT Plastics, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
 - (as **substrate**; latex based adsorbent chip and its preparation and use in (bio)assays)
- IT **Polymers**, reactions
RL: DEV (Device component use); RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
 - (**brush**, in intermediate layer; latex based adsorbent chip and its preparation and use in (bio)assays)
- IT Inorganic compounds
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
 - (crystals, **substrates**; latex based adsorbent chip and its preparation and use in (bio)assays)
- IT Hydrogen bond
 - Hydrophilicity**
 - Hydrophobic force**
 - Van der Waals force
 - (in analyte interaction with adsorbent film; latex based adsorbent chip and its preparation and use in (bio)assays)
- IT Crystals
 - (inorg., **substrates**; latex based adsorbent chip and its preparation and use in (bio)assays)
- IT **Glass**, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
 - (inorg., **substrates**; latex based adsorbent chip and its preparation and use in (bio)assays)
- IT Adsorbents
 - Bioassay
 - Fluorometry
 - Glass substrates**
 - Latex
 - Microarray technology
 - (latex based adsorbent chip and its preparation and use in (bio)assays)

IT **Immobilization, molecular or cellular**
 (of adsorbent film; latex based adsorbent chip and its preparation and use
 in (bio)assays)

IT Electric conductors
 Electric insulators
 Semiconductor materials
 (**substrates**; latex based adsorbent chip and its preparation and
 use in (bio)assays)

IT Oxides (inorganic), uses
 RL: DEV (Device component use); TEM (Technical or engineered material
 use); USES (Uses)
 (**substrates**; latex based adsorbent chip and its preparation and
 use in (bio)assays)

IT 7631-86-9, Silicon dioxide, reactions
 RL: DEV (Device component use); RCT (Reactant); TEM (Technical or
 engineered material use); RACT (Reactant or reagent); USES (Uses)
 (on aluminum **substrate**; latex based adsorbent chip and its
 preparation and use in (bio)assays)

IT 7429-90-5, Aluminum, uses
 RL: DEV (Device component use); TEM (Technical or engineered material
 use); USES (Uses)
 (**substrate**; latex based adsorbent chip and its preparation and use
 in (bio)assays)

L36 ANSWER 15 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STM

ACCESSION NUMBER: 2003:58690 HCAPLUS

DOCUMENT NUMBER: 138:103248

TITLE: Latex based adsorbent chip and its preparation and use
 in (bio)assays

INVENTOR(S): Pohl, Christopher A.

PATENT ASSIGNEE(S): CIPHERGEN BIOSYSTEMS, INC., USA

SOURCE: U.S. Pat. Appl. Publ., 38 pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 2

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|------|----------|-----------------|-------------|
| US 2003017464 | A1 | 20030123 | US 2001-908518 | 20010717 |
| US 2003032043 | A1 | 20030213 | US 2002-197115 | 20020716 |
| WO 2003079402 | A2 | 20030925 | WO 2002-US22611 | 20020716 |
| WO 2003079402 | A3 | 20040527 | | |
| W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW | | | | |
| RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG | | | | |
| EP 1483794 | A2 | 20041208 | EP 2002-807074 | 20020716 |
| R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, SK | | | | |
| PRIORITY APPLN. INFO.: | | | | |
| | | | US 2001-908518 | A2 20010717 |
| | | | US 2002-383008P | P 20020523 |

WO 2002-US22611 W 20020716

- AB The present invention provides an adsorbent chip, which includes three components, a **substrate**, an intermediate layer of linker arms and an adsorbent film, which is attached to the linker arms. The adsorbent film is made up of a plurality of adsorbent particles, each of which includes a binding functionality. The invention also provides a method of making the chips of the invention in which the **substrate**-intermediate film cassette is formed and the adsorbent film is subsequently **immobilized** thereon. When the adsorbent film is from the same preparation across a particular batch of chips, the chips provide for the acquisition of data that are highly reproducible from one chip to the next throughout the particular batch of chips. Addnl., the invention provides methods for using the chips to perform assays.
- IC ICM C12Q001-68
ICS G01N033-53; G01N033-542; C12M001-34
- NCL 435006000; 435007900; 435287200
- CC 9-1 (Biochemical Methods)
Section cross-reference(s): 79, 80
- IT Electric charge
Hydrophobicity
Polarity
(as binding function on adsorbent particle film; latex based adsorbent chip and its preparation and use in (bio)assays)
- IT Amino group
Biochemical molecules
Chelating agents
Drugs
Functional groups
(as binding groups on adsorbent film; latex based adsorbent chip and its preparation and use in (bio)assays)
- IT Plastics, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(as **substrate**; latex based adsorbent chip and its preparation and use in (bio)assays)
- IT **Polymers**, reactions
RL: DEV (Device component use); RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(**brush**, in intermediate layer; latex based adsorbent chip and its preparation and use in (bio)assays)
- IT Inorganic compounds
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(crystals, **substrates**; latex based adsorbent chip and its preparation and use in (bio)assays)
- IT Hydrogen bond
Hydrophilicity
Hydrophobic force
Van der Waals force
(in analyte interaction with adsorbent film; latex based adsorbent chip and its preparation and use in (bio)assays)
- IT Crystals
(inorg., **substrates**; latex based adsorbent chip and its preparation and use in (bio)assays)
- IT **Glass**, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(inorg., **substrates**; latex based adsorbent chip and its preparation and use in (bio)assays)

IT Adsorbents
Bioassay
Fluorometry
Glass substrates
Latex
Microarray technology
(latex based adsorbent chip and its preparation and use in (bio)assays)

IT Immobilization, molecular or cellular
(of adsorbent film; latex based adsorbent chip and its preparation and use in (bio)assays)

IT Electric conductors
Electric insulators
Semiconductor materials
(substrates; latex based adsorbent chip and its preparation and use in (bio)assays)

IT Oxides (inorganic), uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(substrates; latex based adsorbent chip and its preparation and use in (bio)assays)

IT 7631-86-9, Silicon dioxide, reactions
RL: DEV (Device component use); RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(on aluminum substrate; latex based adsorbent chip and its preparation and use in (bio)assays)

IT 7429-90-5, Aluminum, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(substrate; latex based adsorbent chip and its preparation and use in (bio)assays)

L36 ANSWER (16) OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2003:23335 HCAPLUS

DOCUMENT NUMBER: 138:52324

TITLE: Pipette tips for study of biomolecules

INVENTOR(S): Creasey, Andrew

PATENT ASSIGNEE(S): USA

SOURCE: U.S. Pat. Appl. Publ., 9 pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---------------|--|----------|-----------------|----------|
| US 2003007897 | A1 | 20030109 | US 2001-899027 | 20010706 |
| WO 2003004164 | A1 | 20030116 | WO 2002-US21068 | 20020703 |
| W: | AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM | | | |
| RW: | GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG | | | |

PRIORITY APPLN. INFO.: US 2001-899027 A 20010706

AB The invention provides pipet tips having high affinity for target **biomols.** and methods of using the pipet tips for separating, filtering, and purifying samples, preparing samples, culturing cells, and running assays.

IC ICM B01L003-02

NCL 422100000; 073864010

CC 9-1 (Biochemical Methods)

IT Chromatography
(Chiral, materials; pipet tips for study of **biomols.**)

IT Chromatography
(**Hydrophilic**, material; pipet tips for study of **biomols.**)

IT Chromatography
(**Hydrophobic**, material; pipet tips for study of **biomols.**)

IT **Glass**, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(controlled pore; pipet tips for study of **biomols.**)

IT Affinity chromatography
Chromatography
Ion exchange chromatography
Size-exclusion chromatography
(material; pipet tips for study of **biomols.**)

IT Affinity
Analytical apparatus
Animal tissue culture
Biochemical molecules
Cations
Containers
Escherichia coli
Filtration
Functional groups
Immobilization, molecular or cellular
Mixtures
Particle size
Particles
Plasmids
Samples
Separation
Test kits
Volume
(pipet tips for study of **biomols.**)

IT Agglutinins and Lectins
Antibodies and Immunoglobulins
Enzymes, uses
Ligands
RL: NUU (Other use, unclassified); USES (Uses)
(pipet tips for study of **biomols.**)

IT DNA
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
(pipet tips for study of **biomols.**)

IT Fluoropolymers, uses
Glass, uses
Glass beads
Plastics, uses
Polymers, uses
RL: TEM (Technical or engineered material use); USES (Uses)

(pipet tips for study of **biomols.**)
 IT Pipets
 (tips; pipet tips for study of **biomols.**)
 IT 12619-70-4, Cyclodextrin
 RL: NUU (Other use, unclassified); USES (Uses)
 (pipet tips for study of **biomols.**)
 IT 7631-86-9, Silica, uses 9002-84-0, TEFLON
 RL: TEM (Technical or engineered material use); USES (Uses)
 (pipet tips for study of **biomols.**)

L36 ANSWER 17 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN
 ACCESSION NUMBER: 2002:845515 HCAPLUS
 DOCUMENT NUMBER: 137:348737
 TITLE: Arrays of proteins and methods of use thereof
 INVENTOR(S): Wagner, Peter; Ault-Riche, Dana; Nock, Steffen; Itin, Christian
 PATENT ASSIGNEE(S): Zyomyx, Incorporated, USA
 SOURCE: U.S., 31 pp., Cont. of U.S. Ser. No. 115,455.
 CODEN: USXXAM
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 7
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|------|----------|-----------------|-------------|
| US 6475808 | B1 | 20021105 | US 1999-353215 | 19990714 |
| US 6406921 | B1 | 20020618 | US 1998-115455 | 19980714 |
| US 6475809 | B1 | 20021105 | US 2000-570588 | 20000512 |
| US 6630358 | B1 | 20031007 | US 2000-570363 | 20000512 |
| US 2002106702 | A1 | 20020808 | US 2002-112840 | 20020329 |
| US 2002110933 | A1 | 20020815 | US 2002-113964 | 20020329 |
| PRIORITY APPLN. INFO.: | | | US 1998-115455 | A2 19980714 |
| | | | US 1999-353215 | B3 19990714 |

AB Protein arrays for the parallel, in vitro screening of **biomol.** activity are provided. Methods of using the protein arrays are also disclosed. On the arrays, a plurality of different proteins, such as different members of a single protein family, are **immobilized** on one or more organic thin films on the **substrate** surface. The protein arrays are particularly useful in drug development, proteomics, and clin. diagnostics. An array device comprises a **substrate**, an ordered **hydrophobic** polymer monolayer chemisorbed or physisorbed to the surface, a **hydrophilic** polymer monolayer, and protein-**immobilizing** groups covalently attached to a selected fraction of the **hydrophilic** chains within regions on the array, such that application of selected proteins to the array regions forms an array of protein regions, each having a selected surface concentration of a selected protein carried in and displayed on the **hydrophilic** monolayer, and separated from one another by border regions effective to resist nonspecific protein binding. Caspase fusion proteins were **immobilized** on aminoreactive 11,11'-dithiobis(succinimidylundecanoate) attached to gold surfaces of microarrays.

IC ICM G01N033-543
 NCL 436518000
 CC 9-1 (Biochemical Methods)
 Section cross-reference(s): 1, 6, 7
 ST protein array hydrophobic **hydrophilic** polymer monolayer; screening **biomol** protein array; caspase microarray
 IT Hydrocarbons, analysis

RL: ARU (Analytical role, unclassified); DEV (Device component use); TEM (Technical or engineered material use); ANST (Analytical study); USES (Uses)

(C8-22, polymer, as monolayer on **substrate**; arrays of proteins for **biomol.** screening)

IT **Biochemical molecules**

Diagnosis

Drug design

High throughput screening

Immobilization, molecular or cellular

Protein microarray technology

(arrays of proteins for **biomol.** screening)

IT **Proteome**

RL: BSU (Biological study, unclassified); BIOL (Biological study)

(arrays of proteins for **biomol.** screening)

IT **Polyoxyalkylenes, analysis**

RL: ARU (Analytical role, unclassified); DEV (Device component use); TEM (Technical or engineered material use); ANST (Analytical study); USES (Uses)

(as monolayer on **hydrophobic** layer; arrays of proteins for **biomol.** screening)

IT **High throughput screening**

(drug; arrays of proteins for **biomol.** screening)

IT **Drug screening**

(high throughput; arrays of proteins for **biomol.** screening)

IT **Polymers, analysis**

RL: ARU (Analytical role, unclassified); DEV (Device component use); TEM (Technical or engineered material use); ANST (Analytical study); USES (Uses)

(**hydrophilic**, as monolayer on **hydrophobic** layer; arrays of proteins for **biomol.** screening)

IT **Polymers, analysis**

RL: ARU (Analytical role, unclassified); DEV (Device component use); TEM (Technical or engineered material use); ANST (Analytical study); USES (Uses)

(**hydrophobic**, as monolayer on **substrate**; arrays of proteins for **biomol.** screening)

IT **Proteins**

RL: ARG (Analytical reagent use); DEV (Device component use); TEM (Technical or engineered material use); ANST (Analytical study); USES (Uses)

(**immobilized**; arrays of proteins for **biomol.** screening)

IT 7440-21-3, Silicon, uses 7440-32-6, Titanium, uses 7440-57-5, Gold, uses

RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)

(arrays of proteins for **biomol.** screening)

IT 25322-68-3, Polyethyleneglycol

RL: ARU (Analytical role, unclassified); DEV (Device component use); TEM (Technical or engineered material use); ANST (Analytical study); USES (Uses)

(as monolayer on **hydrophobic** layer; arrays of proteins for **biomol.** screening)

IT 186322-81-6DP, Caspase, fusion proteins

RL: BPN (Biosynthetic preparation); RCT (Reactant); BIOL (Biological study); PREP (Preparation); RACT (Reactant or reagent)

(**immobilization** on 2D-protein array; arrays of proteins for **biomol.** screening)

IT 2834-05-1, 11-Bromoundecanoic acid 6066-82-6, N-Hydroxysuccinimide
 7772-98-7, Sodium thiosulfate
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (in preparation of aminoreactive monolayer mol.; arrays of proteins for
biomol. screening)

IT 23483-56-9P, 11,11'-Dithiobis(undecanoic acid)
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT
 (Reactant or reagent)
 (in preparation of aminoreactive monolayer mol.; arrays of proteins for
biomol. screening)

IT 147072-47-7P
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT
 (Reactant or reagent)
 (preparation as aminoreactive mol. on gold; arrays of proteins for
biomol. screening)

REFERENCE COUNT: 152 THERE ARE 152 CITED REFERENCES AVAILABLE FOR
 THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE
 FORMAT

L36 ANSWER (18) OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2002:658885 HCAPLUS

DOCUMENT NUMBER: 137:370710

TITLE: Variable adhesion of micropatterned thermoresponsive
polymer brushes: AFM investigations
 of poly(N-isopropylacrylamide) brushes prepared by
 surface-initiated polymerizations

AUTHOR(S): Jones, Darren M.; Smith, James R.; Huck, Wilhelm T.
 S.; Alexander, Cameron

CORPORATE SOURCE: Melville Laboratory for Polymer Synthesis, Department
 of Chemistry, University of Cambridge, Cambridge, CB2
 3RA, UK

SOURCE: Advanced Materials (Weinheim, Germany) (2002), 14(16),
 1130-1134

CODEN: ADVMEW; ISSN: 0935-9648

PUBLISHER: Wiley-VCH Verlag GmbH

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Atomic force microscopy was used to investigate behavior of surface-grafted
 poly(N-isopropylacrylamide) (PNIPAM) during phase transition and use of
 adhesion force measurements to probe resulting switchable patterns.
 Polymer phase transitions are accompanied by changes in adhesion behavior
 corresponding to **hydrophilic-to-hydrophobic** switch.

The differences in physicochem. properties can be affected in a reversible
 manner in surface micropatterned domains. PNIPAM micropatterned domains
 were prepared by in situ atom-transfer radical polymerization of NIPAM from
 mixed

SANs on gold **substrates**.

CC 37-5 (Plastics Manufacture and Processing)

Section cross-reference(s): 38

ST micropatterned thermoresponsive polyisopropylacrylamide **brush**
 surface initiated **polymn**; adhesion phase transition
hydrophilic hydrophobic switch polyisopropylacrylamide
 brush

IT Adhesion, physical

Hydrophobicity

Phase transition

Polymer chains

Polymerization catalysts

Surface

(AFM investigations of variable adhesion of micropatterned thermoresponsive poly(N-isopropylacrylamide) brushes prepared by surface-initiated polymns.)

IT **Hydrophilicity**

(effect of polymer phase transitions on **hydrophilic-to-hydrophobic** switch of poly(N-isopropylacrylamide) brushes prepared by surface-initiated polymns.)

IT 7440-57-5, Gold, uses

RL: NUU (Other use, unclassified); TEM (Technical or engineered material use); USES (Uses)

(**substrate**; AFM investigations of variable adhesion of micropatterned thermoresponsive poly(N-isopropylacrylamide) brushes prepared by surface-initiated polymns.)

REFERENCE COUNT: 32 THERE ARE 32 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L36 ANSWER (19) OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2002:628917 HCAPLUS

DOCUMENT NUMBER: 138:133288

TITLE: Development of organic dye-doped **silica**

nanoparticles for bioanalysis and biosensors

AUTHOR(S): Tapecc, Rovelyn; Zhao, Xiaojun Julia; Tan, Weihong

CORPORATE SOURCE: Center for Research at the Bio/Nano Interface, Department of Chemistry and the McKnight Brain Institute, University of Florida, Gainesville, FL, 32611, USA

SOURCE: Journal of Nanoscience and Nanotechnology (2002), 2(3/4), 405-409

CODEN: JNNOAR

PUBLISHER: American Scientific Publishers

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The combination of two **silica** precursors, tetraethylorthosilicate and phenyltriethoxysilane, were utilized to synthesize organic dye-doped **silica** nanoparticles. The **hydrophobic** nature of phenyltriethoxysilane keeps the organic dye in the **silica** matrix, whereas the **hydrophilic** tetraethylorthosilicate-formed **silica** allows the resulting nanoparticles to be dispersed in aqueous solns. Characterization of the nanoparticles showed that they could be synthesized in the nanometer range with high photostability and minimal dye leakage. The **silica** matrix of the nanoparticles allows different routes of surface **biomol.** modification for biosensor and bioanal. applications. We have shown different applications of the nanoparticles in bioanal. and in biosensing. Biotin interaction of avidin-coated nanoparticles can be used for the determination of biotinylated bovine serum albumin, and the **immobilization** of glutamate dehydrogenase on the nanoparticle surfaces enables the nanoparticles to be used as biosensors for glutamate determination

CC 9-1 (Biochemical Methods)

ST org dye doped **silica** nanoparticle bioanalysis biosensor

IT Biosensors

Biotinylation

Immobilization, animal

Nanoparticles

(organic dye-doped **silica** nanoparticles for bioanal. and biosensors)

IT Avidins

RL: ARU (Analytical role, unclassified); PEP (Physical, engineering or

chemical process); PYP (Physical process); ANST (Analytical study); PROC (Process)

(organic dye-doped silica nanoparticles for bioanal. and biosensors)

IT Albumins, analysis

RL: ANT (Analyte); ANST (Analytical study)

(serum; organic dye-doped silica nanoparticles for bioanal. and biosensors)

IT 989-38-8, Rhodamine 6G

RL: ARG (Analytical reagent use); ANST (Analytical study); USES (Uses)

(organic dye-doped silica nanoparticles for bioanal. and biosensors)

IT 9029-12-3, NAD(P)-glutamate dehydrogenase

RL: ARG (Analytical reagent use); PEP (Physical, engineering or chemical process); PYP (Physical process); ANST (Analytical study); PROC (Process); USES (Uses)

(organic dye-doped silica nanoparticles for bioanal. and biosensors)

IT 78-10-4, TEOS 780-69-8 7631-86-9, Silica, uses

RL: NUU (Other use, unclassified); USES (Uses)

(organic dye-doped silica nanoparticles for bioanal. and biosensors)

REFERENCE COUNT: 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L36 ANSWER (20) OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2002:624931 HCAPLUS

DOCUMENT NUMBER: 137:338224

TITLE: Synthesis and nanomorphology of multiblock polymer brushes

AUTHOR(S): Baum, Marina; Boyes, Stephen; Granville, Anthony; Mirous, Brian; Sedjo, Randy; Brittain, William J.

CORPORATE SOURCE: Dep. polymer Sci., Univ. Akron, Akron, OH, 44325-3909, USA

SOURCE: Polymer Preprints (American Chemical Society, Division of Polymer Chemistry) (2002), 43(2), 72-73
CODEN: ACPPAY; ISSN: 0032-3934

PUBLISHER: American Chemical Society, Division of Polymer Chemistry

DOCUMENT TYPE: Journal; (computer optical disk)

LANGUAGE: English

AB In this presentation, some of the latest results on polymer brushes will be discussed including (1) new methods of using living radical polymerization to synthesize brushes, (2) the effect of the anchoring group structure on the behavior of self-assembled initiators, (3) the synthesis of semifluorinated polymer brushes, and (4) the synthesis and nanomorphol. of multiblock copolymer brushes. We used reverse addition fragmentation transfer (RAFT) polymerization to prepare poly(N,N-dimethylacrylamide) homopolymer brushes and diblock copolymer brushes. The procedure uses a chain transfer agent (cumyl thiobenzoate) to control the polymerization from a surface-immobilized azo initiator. Without chain transfer agent (CTA), polymer brush formation was uncontrolled; with CTA, we successfully performed incremental monomer addns. and prepared diblock copolymer brushes. Using atom transfer radical polymerization, we prepared two triblock copolymer brushes: Si/SiO₂//PS-b-PMA-b-PS and Si/SiO₂//PMA-b-PS-b-PMA (PS = polystyrene and PMA = poly(Me acrylate)). These multiblock copolymer brushes were characterized via FTIR-ATR, ellipsometry, water contact angles, XPS and

atomic force microscopy. The **brushes** exhibited reversible changes in **surface** composition that was induced by exposure to block-selective solvents.

CC 35-4 (Chemistry of Synthetic High Polymers)

Section cross-reference(s): 36

ST prepn methyl acrylate **styrene** block graft copolymer contact angle

IT Chain transfer

(addition fragmentation transfer polymerization; synthesis and contact angle of

Me acrylate-**styrene** multiblock polymer **brushes**)

IT Polymerization

(atom transfer, radical; synthesis and contact angle of Me acrylate-**styrene** multiblock polymer **brushes**)

IT Chain transfer agents

(synthesis and contact angle of Me acrylate-**styrene** multiblock polymer **brushes**)

IT Contact angle

(water; synthesis and contact angle of Me acrylate-**styrene** multiblock polymer **brushes**)

IT 201611-77-0

RL: RCT (Reactant); RACT (Reactant or reagent)

(RAFT chain transfer agent; synthesis and contact angle of Me acrylate-**styrene** multiblock polymer **brushes**)

IT 7631-86-9D, Silica, reaction products with bromo-isobutyrate

RL: CAT (Catalyst use); USES (Uses)

(catalyst **substrate**; synthesis and contact angle of Me acrylate-**styrene** multiblock polymer **brushes**)

IT 474122-62-8P, Methyl acrylate-**styrene** block graft copolymer

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(di- and triblock; synthesis and contact angle of Me acrylate-**styrene** multiblock polymer **brushes**)

IT 255727-67-4D, reaction products with silica

RL: CAT (Catalyst use); USES (Uses)

(fixed ATRP initiator; synthesis and contact angle of Me acrylate-**styrene** multiblock polymer **brushes**)

IT 600-00-0, Ethyl 2-bromoisobutyrate

RL: CAT (Catalyst use); USES (Uses)

(free initiator; synthesis and contact angle of Me acrylate-**styrene** multiblock polymer **brushes**)

IT 3030-47-5, PMDETA 7787-70-4, Copper bromide (CuBr)

RL: CAT (Catalyst use); USES (Uses)

(synthesis and contact angle of Me acrylate-**styrene** multiblock polymer **brushes**)

IT 9003-21-8P, Poly(methyl acrylate) 9003-53-6P, **Polystyrene**

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(synthesis and contact angle of Me acrylate-**styrene** multiblock polymer **brushes**)

REFERENCE COUNT:

11

THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L36 ANSWER 21 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2002:615396 HCAPLUS

TITLE: Photoactivatable silanes: Synthesis and uses in biopolymer array fabrication on **glass substrates**

AUTHOR(S): Li, Handong; McGall, Glenn

CORPORATE SOURCE: Chemistry, Affymetrix, Inc, Santa Clara, CA, 95051,

SOURCE: USA
Abstracts of Papers, 224th ACS National Meeting,
Boston, MA, United States, August 18-22, 2002 (2002),
COLL-357. American Chemical Society: Washington, D.
C.

CODEN: 69CZPZ

DOCUMENT TYPE: Conference; Meeting Abstract

LANGUAGE: English

AB We wish to report a fast and easy way to build **hydrophobic** layers and **hydrophilic** functional polymer layers thereafter onto **glass** surfaces. A benzophenone-based silane was synthesized and used to prepare stable, **hydrophobic**, photo-activatable coatings on **glass** supports. **Hydrophilic** polymers were then applied to the **substrate**, and photochem. cross-linked to the underlying silane. The resulting **substrates** were suitable for fabricating oligonucleotide probe arrays either by in situ synthesis or **immobilization** methods. The polymer coated surfaces prepared by this method have the following advantages: (1) An initial **hydrophobic** silane coating offers protection from unwanted hydrolysis, and thus increased coating stability. (2) Polymer grafting provides multivalent attachment to the **substrate**, which further increases the coating stability. (3) A plurality of functional groups on the polymer provides increased capacity for subsequent attachment of nucleic acid probes or other **biomols.**, compared to conventional silanated **substrates**. Structure of the polymeric surfaces:.

L36 ANSWER 22 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2002:587878 HCAPLUS

DOCUMENT NUMBER: 137:259324

TITLE: Enolase Adsorption onto **Hydrophobic** and **Hydrophilic** Solid **Substrates**

AUTHOR(S): Almeida, A. T.; Salvadori, M. C.; Petri, D. F. S.

CORPORATE SOURCE: Instituto de Quimica, Universidade de Sao Paulo, Sao Paulo, 05513-970, Brazil

SOURCE: Langmuir (2002), 18(18), 6914-6920

CODEN: LANGD5; ISSN: 0743-7463

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The understanding of the adsorption process of **biomols.** is very important for biol. and engineering applications. Enolase is an enzyme of glycolytic pathway that catalyzes a reversible conversion of 2-phosphoglycerate to phosphoenolpyruvate. In this work the adsorption behavior of enolase (2-phospho-D-glycerate hydrolase) onto **hydrophilic** silicon wafers and amino-terminated surfaces (APS) and onto **hydrophobic** polymer polystyrene (PS) was studied by means of null-ellipsometry. The adsorption kinetics of enolase onto these **substrates** presented three distinct regions: (i) a diffusion-controlled one; (ii) an adsorption plateau; (iii) continuous, irreversible, and asymptotic increase of the adsorbed amount with time. Atomic force microscopy (AFM) showed that well-packed entities formed an enolase biofilm, which might correspond to the monolayer formation. With increase of the adsorption time, aggregates appeared on the surface, suggesting multilayer formation. The early stages might be predicted by the random sequential adsorption model (RSA), while the cooperative sequential adsorption (CSA) model seems to describe regions ii and iii. No significant influence of ionic strength was observed on the adsorption behavior of enolase onto the present **substrates**. The adsorption isotherms show that enolase has no preferential adhesion onto

hydrophilic or hydrophobic substrates.

Contact angle measurements showed that PS surfaces became

hydrophilic and silicon surfaces turned **hydrophobic**

after the formation of the enolase biofilm. The study of the influence of pH on the enolase adsorption on silicon and APS surfaces showed that the higher adsorbed amount occurs when pH is close to enolase pI. Far from pI the enzyme solubility decreases and some repulsive forces come out, leading to a decrease in the adsorbed amount

CC 7-7 (Enzymes)

ST enolase adsorption **hydrophobic hydrophilic** solid surface

IT Adsorption

Conformational transition

(enolase adsorption onto **hydrophobic and hydrophilic solid substrates**)

IT **Immobilization, molecular or cellular**

(enzyme; enolase adsorption onto **hydrophobic and hydrophilic solid substrates**)

IT Adsorption

(protein; enolase adsorption onto **hydrophobic and hydrophilic solid substrates**)

IT 7440-21-3, Silicon, processes 7440-21-3D, Silicon, (aminopropyl)trimethoxysilane-functionalized 9003-53-6, Polystyrene 9014-08-8, Enolase 13822-56-5D, (Aminopropyl)trimethoxysilane, silicon functionalized with

RL: PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)

(enolase adsorption onto **hydrophobic and hydrophilic solid substrates**)

REFERENCE COUNT: 41 THERE ARE 41 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L36 ANSWER (23 OF 54) HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2002:502718 HCAPLUS

DOCUMENT NUMBER: 137:59835

TITLE: Disposable plate electrode with biological active film

INVENTOR(S): Shen, Thomas Y.

PATENT ASSIGNEE(S): Taiwan

SOURCE: U.S., 11 pp.

CODEN: USXXAM

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 2

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---------------|------|----------|-----------------|----------|
| US 6413394 | B1 | 20020702 | US 1999-348824 | 19990708 |
| US 2001024804 | A1 | 20010927 | US 2001-852048 | 20010510 |
| US 6746708 | B2 | 20040608 | | |

PRIORITY APPLN. INFO.: US 1999-348824 A3 19990708

AB A disposable plate electrode with biol. active film is used to cooperate with a biol. sensor for analyzing composition and measuring concentration of a test

sample according to elec. effect resulted from a biochem. reaction. The plate electrode comprises at least an electrode portion for transmission of the elec. effect as well as a biol. active film that reacts with the test sample chemical or biochem. The biol. active film contains a carrier layer (cellulose, for example) for adsorbing and keeping the biol. active

substance (enzyme, for example), which, the carrier layer, can change the electrode portion from **hydrophobic** into **hydrophilic** and protect the biol. active substance against impairment during relatively higher temperature drying process. The method for forming a biol. active film on the disposable electrode is mainly based on screen printing technique to form a conductive film, an elec. insulating layer, a carrier layer, etc., for speedy production and low cost purpose.

IC ICM G01N027-26
 NCL 204403000
 CC 9-1 (Biochemical Methods)
 IT Adsorption
 Animal cell
 Animal tissue
 Anodes
 Biochemical molecules
 Biosensors
 Buffers
 Carriers
 Cathodes
 Cell
 Ceramics
 Composition
 Concentration (condition)
 Drying
 Electric insulators
 Grain size
 Hydrophilicity
 Hydrophobicity
 Immobilization, molecular or cellular
 Interface
 Microorganism
 Mixtures
 Plant cell
 Plant tissue
 Plates
 Reaction
 Reference electrodes
 Samples
 Screen printing
 Sensors
 Solutions
 Temperature
 pH
 (disposable plate electrode with biol. active film)
 IT Albumins, uses
 Amino acids, uses
 Gelatins, uses
 Glass, uses
 Polyoxyalkylenes, uses
 RL: DEV (Device component use); USES (Uses)
 (disposable plate electrode with biol. active film)

REFERENCE COUNT: 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L36 ANSWER 24 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN
 ACCESSION NUMBER: 2002:229591 HCAPLUS
 DOCUMENT NUMBER: 136:397849
 TITLE: Adsorption Behavior of Creatine Phosphokinase onto Solid Substrates

AUTHOR(S): Pancera, S. M.; Alvarez, E. B.; Politi, M. J.;
 Gliemann, H.; Schimmel, Th.; Petri, D. F. S.
 CORPORATE SOURCE: Instituto de Quimica, Universidade de Sao Paulo, Sao
 Paulo, SP, 05513-970, Brazil
 SOURCE: Langmuir (2002), 18(9), 3517-3523
 CODEN: LANGD5; ISSN: 0743-7463
 PUBLISHER: American Chemical Society
 DOCUMENT TYPE: Journal
 LANGUAGE: English

AB The understanding of **biomol.** interactions on solid surfaces is
 of importance for the design of new biomaterials and medical devices. In
 this work, the adsorption behavior of creatine phosphokinase (CPK) onto
hydrophilic (silicon wafers and amino-terminated surfaces),
hydrophobic (polystyrene), and charged (sulfonated polystyrene
 films) **substrates** was investigated by means of in situ
 ellipsometry, contact angle measurements, and atomic force microscopy. CPK
 is an interesting **biomol.** due to its large application in the
 diagnosis for myocardial infarction and muscle disorders. In the dilute
 regime (c .apprx. 0.005 g/L) the ellipsometric measurements revealed that
 the kinetics adsorption process of CPK onto silicon wafers and
 amino-terminated surfaces can be divided into four stages: (i) a diffusive
 one, (ii) adsorption and rearrangement, (iii) formation of a monolayer,
 and (iv) continuous and irreversible adsorption caused by relaxation
 process and cooperative binding. This seems to be the first time that
 such a behavior has been exptl. observed For more concentrated solns., the CPK
 formed aggregates in solution and, therefore, the adsorption increased
 continuously with time. CPK adsorbed irreversibly either on
hydrophilic or on **hydrophobic substrates**. The
 adsorption isotherms showed a preferential adhesion of CPK onto the
hydrophilic substrates. Since **hydrophilic**
 segments predominate the CPK structure, hydrogen bonding seems to play a
 major role in the adsorption process.

CC 7-7 (Enzymes)

ST creatine phosphokinase **immobilization** adsorption polystyrene
 silicon wafer

IT **Immobilization, molecular or cellular**
 (enzyme; hydrogen bonding may play role in adsorption behavior of
 creatine phosphokinase onto solid **substrates**)

IT Cooperative phenomena
 Hydrogen bond
 Muscle, disease
 (hydrogen bonding may play role in adsorption behavior of creatine
 phosphokinase onto solid **substrates**)

IT Heart, disease
 (infarction; hydrogen bonding may play role in adsorption behavior of
 creatine phosphokinase onto solid **substrates**)

IT 9003-53-6D, Polystyrene, sulfonated
 RL: NUU (Other use, unclassified); USES (Uses)
 (films; hydrogen bonding may play role in adsorption behavior of
 creatine phosphokinase onto solid **substrates**)

IT 7647-14-5, Sodium chloride, biological studies 9001-15-4D, Creatine
 phosphokinase, **immobilization**
 RL: BSU (Biological study, unclassified); BIOL (Biological study)
 (hydrogen bonding may play role in adsorption behavior of creatine
 phosphokinase onto solid **substrates**)

IT 9003-53-6, Polystyrene 13822-56-5, Aminopropyltrimethoxysilane
 RL: NUU (Other use, unclassified); USES (Uses)
 (hydrogen bonding may play role in adsorption behavior of creatine
 phosphokinase onto solid **substrates**)

IT 7440-21-3, Silicon, uses
 RL: NUU (Other use, unclassified); USES (Uses)
 (wafers; hydrogen bonding may play role in adsorption behavior of
 creatine phosphokinase onto solid **substrates**)
 REFERENCE COUNT: 35 THERE ARE 35 CITED REFERENCES AVAILABLE FOR THIS
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L36 ANSWER 25 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN
 ACCESSION NUMBER: 2002:51331 HCAPLUS
 DOCUMENT NUMBER: 136:98852
 TITLE: Methods of study for protein patterning and cell
 adhesion properties
 INVENTOR(S): Chen, Christopher S.; Tien, Joe Y.; Tan, John; Bhatia,
 Sangeeta N.; Jastromb, William E.
 PATENT ASSIGNEE(S): The Johns Hopkins University School of Medicine, USA
 SOURCE: PCT Int. Appl., 71 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|--|----------|-----------------|------------|
| WO 2002004113 | A2 | 20020117 | WO 2001-US41344 | 20010711 |
| WO 2002004113 | A3 | 20030123 | | |
| W: | AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM | | | |
| RW: | GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG | | | |
| US 2002182633 | A1 | 20021205 | US 2001-904200 | 20010711 |
| PRIORITY APPLN. INFO.: | | | US 2000-217464P | P 20000711 |

AB The invention concerns a method of adhering a **biomol.** to a **substrate**, comprising treating the **substrate** with a surfactant compound and a **biomol.** More particularly, the invention relates to a method of adhering a **biomol.** to a **substrate** wherein the surfactant compound is not covalently linked to the **substrate**. The invention also relates to a device for adhering a **biomol.** in a predetd. position comprising: a **substrate** having thereon a plurality of cytophilic regions that can adhere a **biomol.** on the **substrate** by cytophobic regions to which the **biomols.** do not adhere contiguous with the cytophilic regions, wherein the cytophobic regions comprise one or more surfactant compds. Diagrams describing the methodol. are given.

IC ICM B01J019-00
 CC 9-16 (Biochemical Methods)
 Section cross-reference(s): 35
 IT Adhesion, biological
 Analytical apparatus
 Animal cell
 Biochemical molecules
 DNA microarray technology
 Electrophoresis
 Eubacteria

Extracellular matrix
Fibroblast
Fluorometry
Fungi
Hematopoietic precursor cell
Human
Hybridoma
Hydrophilicity
Hydrophobicity
Immobilization, molecular or cellular
Liposomes
Lithography
Mammalia
Microorganism
Molecular association
Molecular weight
Photolithography
Printing (impact)
Sulphydryl group
Surfactants
Virus
Xenopus laevis
Yeast

(methods of study for protein patterning and cell adhesion properties)

IT Glass, uses

RL: DEV (Device component use); PRP (Properties); USES (Uses)

(methods of study for protein patterning and cell adhesion properties)

L36 ANSWER 26 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2002:5745 HCAPLUS

DOCUMENT NUMBER: 136:217131

TITLE: Synthesis of Polymer **Brushes** on
Silicate Substrates via Reversible
Addition Fragmentation Chain Transfer Technique
AUTHOR(S): Baum, Marina; Brittain, William J.
CORPORATE SOURCE: Department of Polymer Science, The University of
Akron, Akron, OH, 44325-3909, USA

SOURCE: Macromolecules (2002), 35(3), 610-615

CODEN: MAMOBX; ISSN: 0024-9297

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Reversible addition fragmentation chain transfer (RAFT) has been used to synthesize polymer **brushes**. **Styrene**, Me methacrylate, and N,N-dimethylacrylamide **brushes** were prepared under RAFT conditions using **silicate surfaces** that were modified with **surface**-immobilized azo initiators. Films with controlled thicknesses were produced. RAFT was also used to synthesize PS-b-PDMA and PDMA-b-PMMA block copolymer **brushes** that displayed reversible **surface** properties upon treatment with block-selective solvents.

CC 35-4 (Chemistry of Synthetic High Polymers)

ST polystyrene polymethyl methacrylate

polydimethylacrylamide brush synthesis silicon wafer; block polymer brush synthesis reversible addn fragmentation chain transfer

IT Silanes

RL: CAT (Catalyst use); USES (Uses)

(chloro, reaction products with azo initiators, **surface**)

monolayer; synthesis of polymer **brushes** on **silicate substrates** via reversible addition fragmentation chain transfer technique)

- IT Polymerization
(graft, radical, **surface**; synthesis of polymer **brushes** on **silicate substrates** via reversible addition fragmentation chain transfer technique)
- IT Chain transfer agents
(synthesis of polymer **brushes** on **silicate substrates** via reversible addition fragmentation chain transfer technique)
- IT 7440-21-3, **Silicon**, uses
RL: NUJ (Other use, unclassified); USES (Uses)
(ATR crystal, **substrate**; synthesis of polymer **brushes** on **silicate substrates** via reversible addition fragmentation chain transfer technique)
- IT 201611-77-0
RL: RCT (Reactant); RACT (Reactant or reagent)
(chain transfer agent; synthesis of polymer **brushes** on **silicate substrates** via reversible addition fragmentation chain transfer technique)
- IT 7631-86-9, Aerosil 300, uses
RL: NUJ (Other use, unclassified); USES (Uses)
(colloidal, **substrate**; synthesis of polymer **brushes** on **silicate substrates** via reversible addition fragmentation chain transfer technique)
- IT 401929-59-7P 401929-60-0P
RL: SPN (Synthetic preparation); PREP (Preparation)
(diblock, **surface-grafted**; synthesis of polymer **brushes** on **silicate substrates** via reversible addition fragmentation chain transfer technique)
- IT 200263-56-5D, reaction products with mono- or trichlorosilanes
RL: CAT (Catalyst use); USES (Uses)
(polymerization initiator, **surface** monolayer; synthesis of polymer **brushes** on **silicate substrates** via reversible addition fragmentation chain transfer technique)
- IT 110866-50-7P, **Silica-styrene** graft copolymer
110866-51-8P, Methyl methacrylate-**silica** graft copolymer
209401-49-0P, N,N-Dimethylacrylamide-**silica** graft copolymer
RL: SPN (Synthetic preparation); PREP (Preparation)
(**surface-grafted**; synthesis of polymer **brushes** on **silicate substrates** via reversible addition fragmentation chain transfer technique)
- IT 67-56-1, Methanol, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(transesterification agent for chain "degrafting"; synthesis of polymer **brushes** on **silicate substrates** via reversible addition fragmentation chain transfer technique)

REFERENCE COUNT: 21 THERE ARE 21 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L36 ANSWER 27 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2002:2868 HCAPLUS

DOCUMENT NUMBER: 136:167997

TITLE: Synthesis of Adaptive Polymer
Brushes via "Grafting To" Approach from Melt

AUTHOR(S): Minko, Sergiy; Patil, Satish; Datsyuk, Vitaliy; Simon, Frank; Eichhorn, Klaus-Jochen; Motornov, Michail;

CORPORATE SOURCE: Usov, Denys; Tokarev, Igor; Stamm, Manfred
Department of Polymer Interfaces, Institut fuer
Polymerforschung Dresden e.V., Dresden, 01069, Germany
SOURCE: Langmuir (2002), 18(1), 289-296
CODEN: LANGD5; ISSN: 0743-7463
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English

AB We report a simple method to synthesize binary **polymer brushes** from two incompatible **polymers** of different polarity. The synthetic route is based on a subsequent step-by-step grafting of carboxyl-terminated polystyrene and poly(2-vinylpyridine) to the surface of a Si wafer functionalized with 3-glycidoxypyrpyltrimethoxysilane. The end-functional polymers were spin-coated on the **substrate**, and grafting was carried out at a temperature higher than the **glass** transition temperature of the polymers. The composition of the binary brushes can be regulated based on grafting kinetics of the first polymer by the change of time or/and temperature of grafting. This method reveals a smooth and homogeneous polymer film on the macroscopic scale, while at the nanoscopic scale the system undergoes phase segregation effecting switching/adaptive properties of the film. Upon exposure to different solvents, the film morphol. reversibly switches from "ripple" to "dimple" structures as well as the surface energetic state switches from **hydrophobic** to **hydrophilic**. The same switching of **hydrophilic/hydrophobic** properties was obtained for the different ratios between two grafted **polymers** in the binary **brush**.

CC 37-3 (Plastics Manufacture and Processing)
Section cross-reference(s): 36

ST **hydrophilic hydrophilic** surface morphol switching
polystyrene polyvinylpyridine brush silicon

IT Polymer morphology
(surface; synthesis of adaptive **polymer brushes** via
"grafting to" approach from melt)

IT Contact angle
Hydrophilicity
(synthesis of adaptive **polymer brushes** via
"grafting to" approach from melt and their switching
hydrophilic/hydrophobic behavior)

IT 2530-83-8DP, 3-Glycidylxypropyltrimethoxysilane, esters with
carboxy-terminated polystyrene and polyvinylpyridine
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(Si surface-grafted; synthesis of adaptive **polymer brushes** via grafting to approach from melt)

IT 108-31-6DP, Maleic anhydride, reaction products with polypropylene
9003-07-0DP, Polypropylene, maleic anhydride-terminated
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(binary brushes with polyvinylpyridine; synthesis of adaptive
polymer brushes via grafting to approach from melt)

IT 113023-73-7, 4-(1-Bromoethyl)benzoic acid
RL: RCT (Reactant); RACT (Reactant or reagent)
(initiator for polystyrene synthesis; synthesis of adaptive
polymer brushes via grafting to approach from melt)

IT 9003-53-6DP, Polystyrene, carboxy-terminated, esters with
glycidylxypropyltrimethoxysilane-grafted Si 25014-15-7DP,
Poly(2-vinylpyridine), carboxy-terminated, esters with
glycidylxypropyltrimethoxysilane-grafted Si
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(synthesis of adaptive **polymer brushes** via grafting

to approach from melt)

IT 7440-21-3DP, Silicon, glycidylxypropyl-grafted, esters with
carboxy-terminated polystyrene and poly(2-vinylpyridine)
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(synthesis of adaptive **polymer brushes** via grafting
to approach from melt and their switching **hydrophilic/**
hydrophobic behavior)

IT 64-17-5, Ethanol, uses 108-88-3, Toluene, uses
RL: NUU (Other use, unclassified); USES (Uses)
(synthesis of adaptive **polymer brushes** via grafting
to approach from melt and their switching **hydrophilic/**
hydrophobic behavior in)

REFERENCE COUNT: 44 THERE ARE 44 CITED REFERENCES AVAILABLE FOR THIS
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L36 ANSWER 28 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2001:851758 HCAPLUS

DOCUMENT NUMBER: 135:368907

TITLE: Method and apparatus for the identification and
characterization of molecular interaction events with
molecular arrays

INVENTOR(S): Henderson, Eric; Mosher, Curtis; Lynch, Michael P.

PATENT ASSIGNEE(S): USA

SOURCE: U.S. Pat. Appl. Publ., 21 pp., Division of U.S. Ser.
No. 574,519.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 4

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|------|----------|-----------------|-------------|
| ----- | ---- | ----- | ----- | ----- |
| US 2001044106 | A1 | 20011122 | US 2000-745362 | 20001221 |
| US 2001051337 | A1 | 20011213 | US 2000-574519 | 20000518 |
| US 6573369 | B2 | 20030603 | | |
| US 2003013111 | A1 | 20030116 | US 2002-179102 | 20020625 |
| US 2003073250 | A1 | 20030417 | US 2002-225080 | 20020821 |
| US 2003186311 | A1 | 20031002 | US 2003-427003 | 20030430 |
| PRIORITY APPLN. INFO.: | | | US 1999-135290P | P 19990521 |
| | | | US 2000-574519 | A3 20000518 |
| | | | US 2000-238556P | P 20001010 |
| | | | US 2000-745362 | A1 20001221 |
| | | | US 2001-974757 | A2 20011009 |
| | | | US 2002-225080 | A2 20020821 |

AB The invention concerns an apparatus and method for the formation and anal. of
novel miniature deposition domains. These deposition domains are placed
on a surface to form a mol. array. The mol. array is scanned with an atomic
force microscopy (AFM) to analyze mol. recognition events and the effect
of introduced agents on defined mol. interactions. This approach can be
carried out in a high throughput format, allowing rapid screening of
thousands of mol. species in a solid state array. The procedures
described here have the added benefit of allowing the measurement of
changes in mol. binding events resulting from changes in the anal.
environment or introduction of addnl. effector mols. to the assay system.
The processes described herein are extremely useful in the search for
compds. such as new drugs for treatment of undesirable physiol.
conditions. The method and apparatus of the present invention does not require
the labeling of the deposition material or the target sample and may also

be used to deposit large size mols. without harming the same. Diagrams describing the apparatus are given.

IC ICM C12Q001-68
ICS C12P019-34
NCL 435006000
CC 9-1 (Biochemical Methods)
IT Amino group
Analytical apparatus
Atomic force microscopes
Atomic force microscopy
Biochemical molecules
Capillary tubes
Carboxyl group
Chemicals
Cleaning
Computer application
DNA microarray technology
Drug screening
Elasticity
Friction
Hydrophilicity
Hydrophobicity
Immobilization, biochemical
Light-sensitive materials
Microspheres
Molecular recognition
Photon
Porous materials
Process control
Radiation
Solutions
(method and apparatus for identification and characterization of mol. interaction events with mol. arrays)
IT **Glass, uses**
Glass beads
Mica-group minerals, uses
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(method and apparatus for identification and characterization of mol. interaction events with mol. arrays)

L36 ANSWER (29) OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2001:203920 HCAPLUS
TITLE: Structure and thermodynamics of monolayers of a melt
polymer brush
AUTHOR(S): Goedel, Werner A.; Mallwitz, Frank; Luap, Clarisse;
Peyratout, Claire; Steitz, Roland
CORPORATE SOURCE: Macromolecular & Organic Chemistry, University of Ulm,
Ulm 89081, Germany
SOURCE: Abstracts of Papers, 221st ACS National Meeting, San
Diego, CA, United States, April 1-5, 2001 (2001)
PMSE-220
CODEN: 69FZD4
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal; Meeting Abstract
LANGUAGE: English

AB **Hydrophobic** polymers with low **glass** transition temps.
and **hydrophilic** head groups form insol. monolayers at the
air/water interface. These films resemble single lamellae of phase separated
block-copolymers. Thus, theories which originally have been developed to

describe the latter systems can be applied to the interface bound monolayers. Compared to phase separated Blockcopolymers, however, these monolayers offer the addnl. advantage that the area per polymer chain can easily be changed via lateral compression. Due to the tethering of the head groups to one of the interfaces, the free ends (and any chain segment in between the head group and the free end) distribute in a characteristic, non-centrosym. profile within the monolayer. Due to the constant d. of the polymer, the thickness R is inverse proportional to the area covered by the monolayer [1-2]. Upon lateral compression the polymer chains become increasingly stretched, giving rise to an entropy driven restoring force. In this contribution the inner structure and thermodyn. of monodisperse, bidisperse melt brushes and of partially swollen brushes are investigated and discussed in the framework of current **polymer brush** theories. Baltes, M. Schwendler, C. A. Helm, R. Heger, W. A. Goedel *Macromolecules* 1997, 30, p. 6633-6639 [2] R. Heger, W. A. Goedel, *Macromolecules* 1996, 29, 8912-21 [3] F. Mallwitz Ph.D Thesis.

L36 ANSWER (30) OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2001:183360 HCAPLUS

DOCUMENT NUMBER: 134:353789

TITLE: Switching of **surface** properties with **polymer brushes**

AUTHOR(S): Stamm, Manfred; Minko, Sergiy; Goreschnik, Evgeniy; Usov, Denis; Sidorenko, Alexander

CORPORATE SOURCE: Institut für Polymerforschung Dresden e.V., Dresden, 01069, Germany

SOURCE: Materials Research Society Symposium Proceedings (2001), 629 (Interfaces, Adhesion and Processing in Polymer Systems), FF9.3.1-FF9.3.8
CODEN: MRSPDH; ISSN: 0272-9172

PUBLISHER: Materials Research Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Switchable **surfaces** were fabricated by grafting of two different polymers: polystyrene (PS) and poly(2-vinylpyridine) (PVP) onto the **surface** of Si wafers. The binary **brushes** of various composition, mol. weight, and grafting d. were synthesized via free radical polymerization with an azo-initiator covalently attached to the **surface** of Si wafers. The Si wafers were pretreated with 3-glycidoxypropyltrimethoxysilane or p-aminophenyltrimethoxysilane, then exposed to initiator solution. Polymerization was carried out by immersing the functionalized wafers in the first monomer solution, allowing for polymerization,

rinsing all unreacted materials, then exposing to the second monomer solution. The binary **brushes** are sensitive to the surrounding media.

After exposure to a solvent selective for PVP (ethanol, water + HCl) the **surface** becomes **hydrophilic** and the top of the layer is covered by PVP.

After exposure to a solvent selective for PS (toluene) the **surface** becomes **hydrophobic** and the top of the

layer is enriched with PS segments. Switching kinetics depends on grafting d. and layer composition and varies from several seconds to several minutes at room temperature. The **surface** morphol. and the wetting behavior of the layers switches, i.e., layer reconstruction is reversible and the cycle can be repeated many times.

CC 36-6 (Physical Properties of Synthetic High Polymers)

ST polystyrene polyvinylpyridine **brush surface**
silicon wafer substrate; solvent response polystyrene
polyvinylpyridine **brush** switching

IT **Polymer chains**

- (**brush**; morphol. switching of polystyrene and poly(vinylpyridine) on **silicon substrate** upon exposure to different solvents)
- IT **Polymers, properties**
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(**brush**; morphol. switching of polystyrene and poly(vinylpyridine) on **silicon substrate** upon exposure to different solvents)
- IT Contact angle
(morphol. switching of polystyrene and poly(vinylpyridine) on **silicon substrate** upon exposure to different solvents)
- IT Polymer morphology
(**surface**; morphol. switching of polystyrene and poly(vinylpyridine) on **silicon substrate** upon exposure to different solvents)
- IT 7647-01-0, Hydrochloric acid, uses
RL: NUU (Other use, unclassified); USES (Uses)
(aqueous solution solvent; morphol. switching of polystyrene and poly(vinylpyridine) on **silicon substrate** upon exposure to different solvents)
- IT 78-67-1, AIBN 2638-94-0, 4,4'-Azobis(4-cyanopentanoic acid)
RL: CAT (Catalyst use); USES (Uses)
(azo radical initiator; morphol. switching of polystyrene and poly(vinylpyridine) on **silicon substrate** upon exposure to different solvents)
- IT 9003-53-6P, Polystyrene 25014-15-7P, Poly(2-vinylpyridine)
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(morphol. switching of polystyrene and poly(vinylpyridine) on **silicon substrate** upon exposure to different solvents)
- IT 2530-83-8, 3-Glycidoxypentyltrimethoxysilane 33976-43-1, p-Aminophenyltrimethoxysilane
RL: NUU (Other use, unclassified); USES (Uses)
(**surface** activation reagent; morphol. switching of polystyrene and poly(vinylpyridine) on **silicon substrate** upon exposure to different solvents)
- IT 64-17-5, Ethanol, uses 67-66-3, Chloroform, uses 108-88-3, Toluene, uses 7732-18-5, Water, uses
RL: NUU (Other use, unclassified); USES (Uses)
(switching solvent; morphol. switching of polystyrene and poly(vinylpyridine) on **silicon substrate** upon exposure to different solvents)
- IT 7440-21-3, **Silicon**, uses
RL: NUU (Other use, unclassified); USES (Uses)
(wafer, **substrate**; morphol. switching of polystyrene and poly(vinylpyridine) on **silicon substrate** upon exposure to different solvents)
- REFERENCE COUNT: 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L36 ANSWER 31 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2000:798058 HCAPLUS
TITLE: Environmentally responsive **polymer brush** layers for switchable surface properties.
AUTHOR(S): Minko, Sergiy; Stamm, Manfred; Horeshnik, Evgenij; Usov, Denys; Sidorenko, Alexander
CORPORATE SOURCE: Institut fuer Polymerforschung Dresden, Dresden,

SOURCE: 01069, Germany
Abstracts of Papers, 220th ACS National Meeting,
Washington, DC, United States, August 20-24, 2000
(2000) PMSE-290
CODEN: 69FZC3

PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal; Meeting Abstract
LANGUAGE: English

AB Grafted polymer chains at a solid **substrate** can adopt a brush-like conformation, when the grafting d. is high. Utilizing a mixed grafted layer with different polymer materials offers the addnl. possibility that surface properties are sensitive to the solvent environment and that the properties of the dry film can be switched between different states. As an example the mixed layer of PS and PVP is presented, where the different components show significantly different solution properties. With a selective solvent for PS, the PS component is swollen while PVP is collapsed due to bad solubility. If the layer is dried it shows **hydrophobic** behavior, since PS is located at the outer surface. With water/HCl as a solvent the situation is reversed. Here PVP is in good solvent conditions, while PS is not, which results in a swelling of PVP and a **hydrophilic** general behavior of the dried sample. Surface properties thus can be reversibly switched between two states, and every intermediate state may also be achieved with a mixed solvent. Those mixed grafted layers are thus adaptive to their environment due to a purely conformational effect, i.e. the change of brush conformations in different solvents.

L36 ANSWER 32 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2000:745468 HCAPLUS

DOCUMENT NUMBER: 134:53298

TITLE: Force Measurements between Bacteria and Poly(ethylene glycol)-Coated Surfaces

AUTHOR(S): Razatos, Annetta; Ong, Yea-Ling; Boulay, Fabienne; Elbert, Donald L.; Hubbell, Jeffrey A.; Sharma, Mukul M.; Georgiou, George

CORPORATE SOURCE: Department of Chemical Engineering Department of Petroleum Engineering and Institute for Molecular and Cell Biology, University of Texas, Austin, TX, 78712, USA

SOURCE: Langmuir (2000), 16(24), 9155-9158

CODEN: LANGD5; ISSN: 0743-7463

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The atomic force microscope (AFM) was used to directly measure the forces of interaction between E. coli D21 bacteria and **hydrophilic glass** or **hydrophobic** N-octadecyltrichlorosilane (OTS)-treated **glass substrates** coated with the block copolymers, poly(ethylene glycol) (PEG)-lysine dendron or Pluronic F127 surfactant, resp. Short-range repulsive interactions between bacterial cells and **substrates** coated with the block copolymers were detected by the AFM over distances of separation comparable to the extended length of the PEG polymer chains. In contrast, **glass** and OTS-treated **glass** devoid of PEG-lysine dendron or Pluronic F127 exerted long-range attractive forces on E. coli D21 bacteria. Thus, **polymeric brush** layers appear to not only block the long-range attractive forces of interaction between bacteria and **substrates** but also introduce repulsive steric effects.

CC 9-4 (Biochemical Methods)

Section cross-reference(s): 10

ST atomic force microscopy Escherichia bacteria polymer coated **glass**
 IT **Glass**, uses
 RL: DEV (Device component use); USES (Uses)
 (N-octadecyltrichlorosilane treated, coated with L-Lysine-polyethylene glycol graft copolymer; force measurements between bacteria and poly(ethylene glycol)-coated surfaces)
 IT **Glass**, uses
 RL: DEV (Device component use); USES (Uses)
 (N-octadecyltrichlorosilane treated, coated with Pluronic F127; force measurements between bacteria and poly(ethylene glycol)-coated surfaces)
 IT **Glass**, uses
 RL: DEV (Device component use); USES (Uses)
 (**hydrophilic**; force measurements between bacteria and poly(ethylene glycol)-coated surfaces)
 REFERENCE COUNT: 24 THERE ARE 24 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L36 ANSWER ³³ OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN
 ACCESSION NUMBER: 2000:593962 HCAPLUS
 DOCUMENT NUMBER: 133:310207
 TITLE: Synthesis of polymer **brushes** on **silicate substrates** by reversible addition fragmentation chain transfer technique
 AUTHOR(S): Baum, Marina; Brittain, William J.
 CORPORATE SOURCE: Department of Polymer Science, University of Akron, Akron, OH, 44325, USA
 SOURCE: Polymer Preprints (American Chemical Society, Division of Polymer Chemistry) (2000), 41(2), 1315-1316
 CODEN: ACPPAY; ISSN: 0032-3934
 PUBLISHER: American Chemical Society, Division of Polymer Chemistry
 DOCUMENT TYPE: Journal
 LANGUAGE: English
 AB Utilizing reverse addition fragmentation chain transfer (RAFT) technique to grow polymer **brushes** on a **silicate surface** yields a polymer film with some active dithio chain ends, which can lead to further growth of the immobilized polymer chain. Extrapolation of nitrile peak in the FTIR spectrum allows calcn. of initiator efficiency.
 CC 35-4 (Chemistry of Synthetic High Polymers)
 ST polymer **brush** prepn **silicate surface**;
 reversible addn fragmentation chain transfer polymer
 IT Chain transfer agents
 (phenylpropyl dithiobenzoate; preparation of polymer **brushes** on **silicate substrates** by reversible addition fragmentation chain transfer technique)
 IT Polymerization
 (preparation of polymer **brushes** on **silicate substrates** by reversible addition fragmentation chain transfer technique)
 IT **Silica** gel, miscellaneous
 RL: MSC (Miscellaneous)
 (preparation of polymer **brushes** on **silicate substrates** by reversible addition fragmentation chain transfer technique)
 IT 201611-77-0
 RL: MOA (Modifier or additive use); USES (Uses)
 (chain-transfer agents; preparation of polymer **brushes** on

silicate substrates by reversible addition fragmentation chain transfer technique)

IT 7440-21-3, **Silicon**, miscellaneous

RL: MSC (Miscellaneous)

(preparation of polymer **brushes** on **silicate**

substrates by reversible addition fragmentation chain transfer technique)

IT 9003-53-6P, **Polystyrene** 9011-14-7P, **PMMA** 26793-34-0P

, **N,N-Dimethylacrylamide** homopolymer 110453-53-7P, **N,N-Dimethylacrylamide-styrene** block copolymer

RL: SPN (Synthetic preparation); PREP (Preparation)

(preparation of polymer **brushes** on **silicate**

substrates by reversible addition fragmentation chain transfer technique)

IT 302594-37-2

RL: RCT (Reactant); RACT (Reactant or reagent)

(preparation of polymer **brushes** on **silicate**

substrates by reversible addition fragmentation chain transfer technique in presence of)

IT 37811-13-5P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(preparation of polymer **brushes** on **silicate**

substrates by reversible addition fragmentation chain transfer technique in presence of)

REFERENCE COUNT: 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L36 ANSWER 34 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2000:519109 HCAPLUS

DOCUMENT NUMBER: 133:238364

TITLE: Surface Functionalization with Polymer and Block Copolymer Films Using Organometallic Initiators

AUTHOR(S): Ingall, Michael D. K.; Joray, Scott J.; Duffy, Daniel J.; Long, David P.; Bianconi, Patricia A.

CORPORATE SOURCE: Department of Chemistry, The University of Massachusetts at Amherst, Amherst, MA, 01003, USA

SOURCE: Journal of the American Chemical Society (2000), 122(32), 7845-7846

CODEN: JACSAT; ISSN: 0002-7863

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Lanthanide organometallic catalysts were used to surface-graft **polymer brushes** of common, com. important, noncyclic olefins to a layer of 5-hexenylsilane on a silicon surface. The 5-hexenyltrichlorosilane precursor reacted with the pretreated silicon and the functionalized **substrate** was exposed to a THF solution of (Cp)₂Sm(THF)₂ resulting in formation of Sm-bound allyls that are efficient polymerization catalysts. The catalyst **substrate** was placed in an atmospheric of 1200 psi of ethylene for 12 to 72 h films of polyethylene of about 90 nm formed on the Si surface. The IR bands at 1098, 1060, and 1016 cm⁻¹ demonstrate covalent bonding of the polymer to the silicon surface via Si-O-Si linkages, and siloxane network modes. These films could not be removed by application of a pressure-sensitive adhesive whereas polyethylene formed on nonfunctionalized Si could be completely removed. The catalyst-functionalized Si **substrates** were also exposed to Me methacrylate and after 1-9 days, poly(Me methacrylate) films of 30-130 nm were formed, which were also firmly attached to the Si surface. The

polyethylene Sm catalyst **substrates** were partially immersed in Me methacrylate (MMA), such that half the **substrate** was suspended in the neat monomer, while the other half remained above the liquid. After 1-9 days, portions of the **substrates** exposed to MMA had surface films of PMMA, 1.0 μ m, while the portions unexposed to MMA showed only polyethylene. Thus, the organometallic initiation system produces surfaces functionalized with strongly bound, films of underlying polyethylene and surface PMMA and a wide variety of engineered surfaces can be produced, including **hydrophilic/hydrophobic** block copolymer films.

CC 35-3 (Chemistry of Synthetic High Polymers)

Section cross-reference(s): 67

IT Polymerization catalysts

(metallocene; samarocene anchored to allylsilane functionalized silicon as olefin polymerization initiators and preparation of strongly-adhered polyethylene and PMMA films on catalyst **substrates**)

IT Catalyst supports

Surface composition

(samarocene anchored to allylsilane functionalized silicon as olefin polymerization initiators and preparation of strongly-adhered polyethylene

and PMMA

films on catalyst **substrates**)

IT 84086-52-2

RL: RCT (Reactant); RACT (Reactant or reagent)

(precursor; samarocene anchored to allylsilane functionalized silicon as olefin polymerization initiators and preparation of strongly-adhered polyethylene and PMMA films on catalyst **substrates**)

IT 9002-88-4P, Polyethylene 9011-14-7P, PMMA

RL: SPN (Synthetic preparation); PREP (Preparation)

(samarocene anchored to allylsilane functionalized silicon as olefin polymerization initiators and preparation of strongly-adhered polyethylene

and PMMA

films on catalyst **substrates**)

IT 18817-29-3

RL: RCT (Reactant); RACT (Reactant or reagent)

(silanization agent; samarocene anchored to allylsilane functionalized silicon as olefin polymerization initiators and preparation of

strongly-adhered

polyethylene and PMMA films on catalyst **substrates**)

IT 7440-21-3, Silicon, uses

RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)

(vinyl-terminated silane, support; samarocene anchored to allylsilane functionalized silicon as olefin polymerization initiators and preparation

of

strongly-adhered polyethylene and PMMA films on catalyst **substrates**)

IT 80695-16-5, Samarocene

RL: CAT (Catalyst use); USES (Uses)

(vinylsilane-anchored; samarocene anchored to allylsilane

functionalized silicon as olefin polymerization initiators and preparation

of

strongly-adhered polyethylene and PMMA films on catalyst **substrates**)

REFERENCE COUNT:

28

THERE ARE 28 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L36 ANSWER 35 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1999:696980 HCAPLUS

DOCUMENT NUMBER: 132:23387
TITLE: Switching of Polymer Brushes
AUTHOR(S): Sidorenko, Alexander; Minko, Sergiy; Schenk-Meuser, Karin; Duschner, Heinz; Stamm, Manfred
CORPORATE SOURCE: Max-Planck-Institut fuer Polymerforschung, Mainz, 55128, Germany
SOURCE: Langmuir (1999), 15(24), 8349-8355
CODEN: LANGD5; ISSN: 0743-7463
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English

AB **Brushlike polymer** monolayers composed of two different polymers, polystyrene and poly(2-vinylpyridine), are grafted by radical polymerization on the surface of silicon wafers. Thickness, grafting d., mol. weight of grafted chains, and the composition of the layers were regulated by grafting time, monomer concentration, and addnl. initiator in solution
A typical dry film thickness is between 10 and 100 nm, and the mol. wts. of the components range from 100 to 300 kg/mol. The fabricated layers turn out to be sensitive to the composition of the environment. For instance after exposure to toluene, the layer becomes hydrophobic and the top of the layer is covered by polystyrene. After exposure to HCl, the layer becomes hydrophilic with polyvinylpyridine in the upper layer. This reconstruction of the polymer layer was observed with contact angle and XPS measurements. The composition of the top layer in different media is controlled by the composition and mol. weight

of the two polymers in the monolayer. The "switching" properties of the layer are shown to be reversible.
CC 36-7 (Physical Properties of Synthetic High Polymers)
IT Polymer chains
(conformation; solvent effect on inversion of mixed-polymer monolayers grafted on **silicon wafers**)
IT Polymerization
(graft; solvent effect on inversion of mixed-polymer monolayers grafted on **silicon wafers**)
IT 7440-21-3, **Silicon**, uses
RL: RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(**substrate**; solvent effect on inversion of mixed-polymer monolayers grafted on **silicon wafers**)

REFERENCE COUNT: 38 THERE ARE 38 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L36 ANSWER 36 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1999:558730 HCAPLUS
DOCUMENT NUMBER: 132:152229
TITLE: Controlled interfacial interaction using grafted random copolymers
AUTHOR(S): Russell, T. P.; Huang, E.; Husseman, M.; Malmstrom, E. E.; Hawker, C. J.
CORPORATE SOURCE: Polymer Science and Engineering Department, University of Massachusetts, Amherst, MA, 01003, USA
SOURCE: Polymer Preprints (American Chemical Society, Division of Polymer Chemistry) (1999), 40(2), 112-113
CODEN: ACPPAY; ISSN: 0032-3934
PUBLISHER: American Chemical Society, Division of Polymer Chemistry

DOCUMENT TYPE: Journal
LANGUAGE: English

AB Random copolymer brushes poly(styrene-Me methacrylate) (S-MMA) and poly(styrene-2-hydroxyethyl methacrylate) (S-HEMA) were prepared by the grafting to and grafting from approaches, resp. using unimol. TEMPO and alkoxyamine initiators. The copolymers with hydroxy and TEMPO end groups were grafted to Si **substrates** to obtain the brushes. The wettability and block copolymer orientation in thin films of P(S-MMA) brush systems and **hydrophilic/hydrophobic** control of P(S-HEMA) systems were studied. The strategy of using random copolymer brush layers to finely tune the characteristics of a surface is generic and can be applied to other polymeric systems.

CC 35-4 (Chemistry of Synthetic High Polymers)
Section cross-reference(s): 36

ST styrene methyl methacrylate **brush polymer** prepn;
grafting silicon surface **polymer brush** control
interfacial interaction

IT **Polymers**, processes
RL: PEP (Physical, engineering or chemical process); PRP (Properties);
PROC (Process)
(**brush; hydrophobicity** control of silicon by
surface-grafted random copolymer brushes)

IT Contact angle
Polymer morphology
Wettability
(**hydrophobicity** control of silicon by surface-grafted random
copolymer brushes)

IT Polymer chains
(orientation; **hydrophobicity** control of silicon by
surface-grafted random copolymer brushes)

IT 25034-86-0, Methyl methacrylate-styrene copolymer 26010-51-5,
2-Hydroxyethyl methacrylate-styrene copolymer
RL: PEP (Physical, engineering or chemical process); PRP (Properties);
PROC (Process)
(**hydrophobicity** control of silicon by surface-grafted random
copolymer brushes)

IT 2564-83-2, TEMPO
RL: CAT (Catalyst use); USES (Uses)
(initiator; **hydrophobicity** control of silicon by
surface-grafted random copolymer brushes)

IT 7440-21-3, Silicon, uses
RL: NUU (Other use, unclassified); USES (Uses)
(**substrates; hydrophobicity** control of silicon by
surface-grafted random copolymer brushes)

REFERENCE COUNT: 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L36 ANSWER 37 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1999:211299 HCAPLUS
DOCUMENT NUMBER: 130:352729
TITLE: Novel methods for the fabrication of well-defined and
patterned **polymer brushes**
AUTHOR(S): Benoit, Didier; Husemann, Marc; Mecerreyes, David;
Morrison, Michael; Hinsberg, William; Hawker, Craig
J.; Hedrick, James L.; Shah, Rahul; Abbott, Nicholas
L.
CORPORATE SOURCE: IBM Almaden Research Center, San Jose, CA, 95120-6099,
USA
SOURCE: Polymer Preprints (American Chemical Society, Division

- of Polymer Chemistry) (1999), 40(1), 498-499
 CODEN: ACPPAY; ISSN: 0032-3934
- PUBLISHER: American Chemical Society, Division of Polymer Chemistry
- DOCUMENT TYPE: Journal
- LANGUAGE: English
- AB Strategies were developed for the preparation of patterned **polymer brushes**, either isolated structures from microcontact printed Au surfaces, or chemical patterning of continuous brush structures using lithog. techniques. A non-reactive self-assembled monolayer [SAM] of CH₃(CH₂)₁₅SH is microcontact printed onto a gold surface, then HO(CH₂CH₂O)₂(CH₂)₁₁SH was selectively assembled onto the bare regions of the gold surface. The final step is surface initiated ring opening polymerization of ε-caprolactone or polymerization of other monomers from the functionalized areas of the patterned SAM based on the hydroxyl groups as initiators. Another strategy involves the patterning of a continuous **polymer brush** into areas of **hydrophilic** and **hydrophobic** chains; an alkoxyamine initiator can be readily hydrosilylated with trichlorosilane to obtain the trichlorosilyl derivative. This derivative can be attached to a variety of surfaces, e.g., native silicon oxide layer of silicon wafers by reaction with the surface silanol groups. **Polymer brushes** can then be grown on the functionalized surface from vinyl monomers. Patterning of **polymer brushes** involved spin coating a photoresist layer on the **polymer brush**, exposure of the photoresist to deep-UV irradiation through a mask, forming a photoacid that diffuses to the **polymer brush**. Removal of the photoresist led to the patterned brush.
- CC 35-7 (Chemistry of Synthetic High Polymers)
 Section cross-reference(s): 36
- ST alkylthiol self assembled monolayer hydroxythiol pattern; caprolactone **polymn thiol pattern polymer brush**
- IT **Polymers**, preparation
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (**brush**; novel methods for fabrication of well-defined and patterned **polymer brushes**)
- IT Photolithography
 Photoresists
 Self-assembled monolayers
 (novel methods for fabrication of well-defined and patterned **polymer brushes**)
- IT Polyketones
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (novel methods for fabrication of well-defined and patterned **polymer brushes**)
- IT Polymerization
 (ring-opening; novel methods for fabrication of well-defined and patterned **polymer brushes**)
- IT Coating process
 (spin; novel methods for fabrication of well-defined and patterned **polymer brushes**)
- IT 25232-27-3P, Poly(tert-butyl acrylate)
 RL: PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
 (**brush**; novel methods for fabrication of well-defined and patterned **polymer brushes**)
- IT 24980-41-4P, Poly(ε-caprolactone) 25248-42-4P,
 Poly[oxy(1-oxo-1,6-hexanediyl)]
 RL: SPN (Synthetic preparation); PREP (Preparation)

(brush; novel methods for fabrication of well-defined and patterned **polymer brushes**)

IT 225229-07-2P
 RL: NUU (Other use, unclassified); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
 (novel methods for fabrication of well-defined and patterned **polymer brushes**)

IT 821-41-0, Hex-5-en-1-ol 10025-78-2, Trichlorosilane 212132-38-2
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (novel methods for fabrication of well-defined and patterned **polymer brushes**)

IT 225229-06-1P
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
 (novel methods for fabrication of well-defined and patterned **polymer brushes**)

IT 9003-01-4P, Poly(acrylic acid)
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (patterned brush; novel methods for fabrication of well-defined and patterned **polymer brushes**)

IT 2917-26-2, Hexadecylthiol 149731-67-9
 RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
 (patterned surface; novel methods for fabrication of well-defined and patterned **polymer brushes**)

IT 7440-57-5, Gold, uses 7631-86-9, **Silica**, uses
 RL: NUU (Other use, unclassified); USES (Uses)
 (**substrate**; novel methods for fabrication of well-defined and patterned **polymer brushes**)

REFERENCE COUNT: 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L36 ANSWER 38 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1999:196967 HCAPLUS

DOCUMENT NUMBER: 130:252877

TITLE: Vitrification of monolayers of a **polymer brush**

AUTHOR(S): Goedel, Werner A.; Peyratout, Claire; Ouali, Lahoussine; Schaedler, Volker

CORPORATE SOURCE: Max-Planck-Inst. Kolloid- Grenzflaechenforschung, Berlin, D-12489, Germany

SOURCE: Advanced Materials (Weinheim, Germany) (1999), 11(3), 213-217

CODEN: ADVMEW; ISSN: 0935-9648

PUBLISHER: Wiley-VCH Verlag GmbH

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The presence of **hydrophilic** head groups in **hydrophobic** polymers have a dramatic effect on the ability of the polymer to spread into a smooth monolayer, as did the state of the polymer was melt or **glassy**. The influence of the **glass** transition on the surface activity of such polymers was determined on polybutylstyrene-N+ as a monolayer spread on a water surface at temps. above and below its **glass** transition temperature. The behavior of the monolayer before and after vitrification was investigated.

CC 36-3 (Physical Properties of Synthetic High Polymers)

Section cross-reference(s): 66

ST **polymer brush** monolayer **glass** transition
 temp surface pressure vitrification

IT Adsorbed monolayers
(Langmuir-Blodgett; influence of **glass** transition on surface activity of polybutylstyrene-N⁺ monolayers)

IT **Glass** transition temperature
Surface pressure
Vitrification
(influence of **glass** transition on surface activity of polybutylstyrene-N⁺ monolayers)

IT 30815-20-4D, Poly(4-butylstyrene), trimethylammonium bromide-terminated
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(influence of **glass** transition on surface activity of polybutylstyrene-N⁺ monolayers)

REFERENCE COUNT: 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L36 ANSWER 39 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1998:282813 HCAPLUS
DOCUMENT NUMBER: 128:267932
TITLE: Printing Patterns of Proteins
AUTHOR(S): Bernard, Andre; Delamarche, Emmanuel; Schmid, Heinz; Michel, Bruno; Bosshard, Hans Rudolf; Biebuyck, Hans
CORPORATE SOURCE: Zurich Research Laboratory, IBM Research Division, Rueschlikon, CH-8803, Switz.
SOURCE: Langmuir (1998), 14(9), 2225-2229
CODEN: LANGD5; ISSN: 0743-7463
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Microcontact printing of proteins proves to be an excellent means of directly patterning **biomols.** on solid **substrates.** Monolayer quantities of protein equilibrated on the surface of a **hydrophobic**, elastomeric stamp are **immobilized** there to rinses with buffer. These **biomols.** can nevertheless transfer with >99% efficiency from the stamp to a **substrate** after just 1 s of contact. This capability allows the simple creation of functional patterns of proteins at scales that involve the placement of <1000 mols. in well-defined locations on a surface. The method is suited for the transfer of proteins of many different types onto **hydrophilic** or **hydrophobic substrates.**

CC 9-16 (Biochemical Methods)

IT **Biochemical molecules**
Transfers
(printing patterns of proteins)

REFERENCE COUNT: 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L36 ANSWER 40 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1997:682616 HCAPLUS
DOCUMENT NUMBER: 127:323150
TITLE: Forces between Adsorbed Layers of β -Casein
AUTHOR(S): Nylander, Tommy; Wahlgren, N. Magnus
CORPORATE SOURCE: Center for Chemistry and Chemical Engineering, Lund University, Lund, S-221 00, Swed.
SOURCE: Langmuir (1997), 13(23), 6219-6225
CODEN: LANGD5; ISSN: 0743-7463
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English

AB The forces between β -casein layers adsorbed onto mica **surfaces** have been measured as a function of **surface** separation by using the interferometric **surface** force apparatus Both **hydrophilic** pure mica and a mica **surface**, which has been made **hydrophobic** by Langmuir-Blodgett deposition of dimethyldioctadecylammonium bromide, were used. A long-range repulsive force, most probably of electrostatic origin, was observed between β -casein layers adsorbed on hydrobized mica. The results suggest that β -casein forms a monolayer on this **surface**, where the outer part is less densely packed and protrudes far out into the solution This open **brushlike** structure can readily be compressed on which an attractive force arises. The portion of the monolayer closest to the **hydrophobized surface** is much more compact and has low compressibility. On the pure **hydrophilic surface** a bilayer structure is more likely, with the a compact inner layer and an outer layer which has a similar structure to the monolayer formed on a **hydrophobic surface**.

CC 66-4 (Surface Chemistry and Colloids)

ST casein adsorbate mica repulsive force **hydrophobicity**

IT Mica-group minerals, processes

RL: PEP (Physical, engineering or chemical process); PROC (Process)
(**substrate**; forces between adsorbed layers of β -casein)

IT **Hydrophilicity**

Hydrophobicity

(**surface**; forces between adsorbed layers of β -casein)

REFERENCE COUNT: 35 THERE ARE 35 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L36 ANSWER 41 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1997:344801 HCAPLUS

DOCUMENT NUMBER: 127:2751

TITLE: Refunctionalized oxyfluorinated surfaces

INVENTOR(S): Gardella, Joseph A., Jr.; Vargo, Terrence G.

PATENT ASSIGNEE(S): The Research Foundation of State University of New York, USA

SOURCE: U.S., 15 pp., Cont.-in-part of U.S. Ser. No. 151,533, abandoned.

CODEN: USXXAM

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 2

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|------|----------|-----------------|-------------|
| ----- | ---- | ----- | ----- | ----- |
| US 5627079 | A | 19970506 | US 1994-307919 | 19940916 |
| US 4946903 | A | 19900807 | US 1989-328852 | 19890327 |
| US 5266309 | A | 19931130 | US 1990-522532 | 19900511 |
| PRIORITY APPLN. INFO.: | | | US 1989-328852 | A2 19890327 |
| | | | US 1990-522532 | A2 19900511 |
| | | | US 1993-151533 | B2 19931112 |

AB Permanently substituted oxyfluorinated surfaces can be formed on nonfluorinated **substrates** having a fluorinated surface or fluorocarbon coating applied by gas phase surface fluorination or plasma deposition. The oxyfluorinated surfaces can be refunctionalized by bonding organosilanes, isothiocyanate-containing fluorescent compds. and proteins, such as enzymes, antibodies and peptides directly to such surfaces. Surfaces refunctionalized with such protein based groups are useful in the fabrication of biol. sensors, devices for separation of cell

lines, and filtration applications for selective binding of antigens. Masking techniques can be employed in forming a predetd. pattern of covered and exposed surfaces, for example, prior to oxyfluorination. Among the examples given are the preparation of a liquid chromatog. column for the determination of serum albumin, an electrochem. immunosensitive sensor with **immobilized** Con A for studying binding of yeast mannan, and an immunosensitive field-effect transistor for detecting Wassermann antigen in syphilis diagnosis.

IC ICM G01N033-543
ICS H05H001-00; B05D005-00; B32B027-00

NCL 436525000

CC 9-16 (Biochemical Methods)
Section cross-reference(s): 13, 14

ST oxyfluorinated surface functionalization protein **immobilization**
biosensor; immunosensor syphilis diagnosis oxyfluorinated surface; liq chromatog column oxyfluorinated surface; lectin binding immunosensor oxyfluorinated surface

IT Syphilis
(Wassermann reaction; refunctionalized oxyfluorinated surfaces for **biomol. immobilization** in sensors)

IT Macromolecular compounds
RL: ARG (Analytical reagent use); RCT (Reactant); ANST (Analytical study); RACT (Reactant or reagent); USES (Uses)
(biol.; refunctionalized oxyfluorinated surfaces for **biomol. immobilization** in sensors)

IT Synthetic fibers
RL: ARU (Analytical role, unclassified); DEV (Device component use); ANST (Analytical study); USES (Uses)
(ceramic, boride; refunctionalized oxyfluorinated surfaces for **biomol. immobilization** in sensors)

IT Synthetic fibers
RL: ARU (Analytical role, unclassified); DEV (Device component use); ANST (Analytical study); USES (Uses)
(ceramic, carbide; refunctionalized oxyfluorinated surfaces for **biomol. immobilization** in sensors)

IT Synthetic fibers
RL: ARU (Analytical role, unclassified); DEV (Device component use); ANST (Analytical study); USES (Uses)
(ceramic, nitride; refunctionalized oxyfluorinated surfaces for **biomol. immobilization** in sensors)

IT Ceramics
RL: ARU (Analytical role, unclassified); DEV (Device component use); ANST (Analytical study); USES (Uses)
(fibers, boride; refunctionalized oxyfluorinated surfaces for **biomol. immobilization** in sensors)

IT Ceramics
RL: ARU (Analytical role, unclassified); DEV (Device component use); ANST (Analytical study); USES (Uses)
(fibers, carbide; refunctionalized oxyfluorinated surfaces for **biomol. immobilization** in sensors)

IT Ceramics
RL: ARU (Analytical role, unclassified); DEV (Device component use); ANST (Analytical study); USES (Uses)
(fibers, nitride; refunctionalized oxyfluorinated surfaces for **biomol. immobilization** in sensors)

IT Hydrocarbons, analysis
RL: ARU (Analytical role, unclassified); NUU (Other use, unclassified); ANST (Analytical study); USES (Uses)
(fluoro; refunctionalized oxyfluorinated surfaces for **biomol.**

immobilization in sensors)

IT Antibodies
Enzymes, preparation
Proteins, specific or class
RL: ARG (Analytical reagent use); SPN (Synthetic preparation); ANST (Analytical study); PREP (Preparation); USES (Uses)
(immobilized; refunctionalized oxyfluorinated surfaces for biomol. immobilization in sensors)

IT Field effect transistors
(immunochem. sensitive; refunctionalized oxyfluorinated surfaces for biomol. immobilization in sensors)

IT Biosensors
(immunol., fiber-optic; refunctionalized oxyfluorinated surfaces for biomol. immobilization in sensors)

IT Biosensors
(immunosensors; refunctionalized oxyfluorinated surfaces for biomol. immobilization in sensors)

IT Proteins, specific or class
RL: ARG (Analytical reagent use); RCT (Reactant); ANST (Analytical study); RACT (Reactant or reagent); USES (Uses)
(metalloproteins; refunctionalized oxyfluorinated surfaces for biomol. immobilization in sensors)

IT Alloys, analysis
RL: ARU (Analytical role, unclassified); DEV (Device component use); ANST (Analytical study); USES (Uses)
(nonferrous; refunctionalized oxyfluorinated surfaces for biomol. immobilization in sensors)

IT Silanes
RL: RCT (Reactant); RACT (Reactant or reagent)
(organosilanes; refunctionalized oxyfluorinated surfaces for biomol. immobilization in sensors)

IT Fluoropolymers, analysis
RL: ARU (Analytical role, unclassified); DEV (Device component use); NUU (Other use, unclassified); ANST (Analytical study); USES (Uses)
(oxy-; refunctionalized oxyfluorinated surfaces for biomol. immobilization in sensors)

IT Biosensors
Blood analysis
Electric conductors
Electric insulators
Electrodes
Films
Filters
Fluorination
Glow discharge
Hydrophilicity
Hydrophobicity
Immobilization, biochemical
Interfacial energy
Liquid chromatographic columns
Membranes, nonbiological
Plasma
Semiconductor materials
Separators
Wettability
(refunctionalized oxyfluorinated surfaces for biomol. immobilization in sensors)

IT Antigens
RL: ANT (Analyte); THU (Therapeutic use); ANST (Analytical study); BIOL

(Biological study); USES (Uses)
(refunctionalized oxyfluorinated surfaces for biomol.
immobilization in sensors)

IT Agglutinins and Lectins
RL: ARG (Analytical reagent use); BPR (Biological process); BSU
(Biological study, unclassified); RCT (Reactant); ANST (Analytical study);
BIOL (Biological study); PROC (Process); RACT (Reactant or reagent); USES
(Uses)
(refunctionalized oxyfluorinated surfaces for biomol.
immobilization in sensors)

IT Antibodies
Biopolymers
DNA
Glycoproteins, general, reactions
Immunoglobulins
Ion exchangers
Ionophores
Oligonucleotides
Polynucleotides
Proteins, general, reactions
RNA
Receptors
RL: ARG (Analytical reagent use); RCT (Reactant); ANST (Analytical study);
RACT (Reactant or reagent); USES (Uses)
(refunctionalized oxyfluorinated surfaces for biomol.
immobilization in sensors)

IT Acrylic polymers, analysis
RL: ARU (Analytical role, unclassified); DEV (Device component use); ANST
(Analytical study); USES (Uses)
(refunctionalized oxyfluorinated surfaces for biomol.
immobilization in sensors)

IT Alloys, analysis
RL: ARU (Analytical role, unclassified); DEV (Device component use); ANST
(Analytical study); USES (Uses)
(refunctionalized oxyfluorinated surfaces for biomol.
immobilization in sensors)

IT Ceramics
RL: ARU (Analytical role, unclassified); DEV (Device component use); ANST
(Analytical study); USES (Uses)
(refunctionalized oxyfluorinated surfaces for biomol.
immobilization in sensors)

IT Ferroalloys
RL: ARU (Analytical role, unclassified); DEV (Device component use); ANST
(Analytical study); USES (Uses)
(refunctionalized oxyfluorinated surfaces for biomol.
immobilization in sensors)

IT Metals, analysis
RL: ARU (Analytical role, unclassified); DEV (Device component use); ANST
(Analytical study); USES (Uses)
(refunctionalized oxyfluorinated surfaces for biomol.
immobilization in sensors)

IT Oxides (inorganic), analysis
RL: ARU (Analytical role, unclassified); DEV (Device component use); ANST
(Analytical study); USES (Uses)
(refunctionalized oxyfluorinated surfaces for biomol.
immobilization in sensors)

IT Polycarbonates, analysis
RL: ARU (Analytical role, unclassified); DEV (Device component use); ANST
(Analytical study); USES (Uses)

- (refunctionalized oxyfluorinated surfaces for **biomol.**
immobilization in sensors)
- IT Polyester, analysis
RL: ARU (Analytical role, unclassified); DEV (Device component use); ANST (Analytical study); USES (Uses)
(refunctionalized oxyfluorinated surfaces for **biomol.**
immobilization in sensors)
- IT Polymers, analysis
RL: ARU (Analytical role, unclassified); DEV (Device component use); ANST (Analytical study); USES (Uses)
(refunctionalized oxyfluorinated surfaces for **biomol.**
immobilization in sensors)
- IT Polyolefins
RL: ARU (Analytical role, unclassified); DEV (Device component use); ANST (Analytical study); USES (Uses)
(refunctionalized oxyfluorinated surfaces for **biomol.**
immobilization in sensors)
- IT Polyurethanes, analysis
RL: ARU (Analytical role, unclassified); DEV (Device component use); ANST (Analytical study); USES (Uses)
(refunctionalized oxyfluorinated surfaces for **biomol.**
immobilization in sensors)
- IT Fluoropolymers, analysis
Fluoropolymers, analysis
Plastics, analysis
RL: ARU (Analytical role, unclassified); NUU (Other use, unclassified); RCT (Reactant); ANST (Analytical study); RACT (Reactant or reagent); USES (Uses)
(refunctionalized oxyfluorinated surfaces for **biomol.**
immobilization in sensors)
- IT Peptides, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(refunctionalized oxyfluorinated surfaces for **biomol.**
immobilization in sensors)
- IT pH
(sensors; refunctionalized oxyfluorinated surfaces for **biomol.**
immobilization in sensors)
- IT Albumins, analysis
RL: ANT (Analyte); ANST (Analytical study)
(serum; refunctionalized oxyfluorinated surfaces for **biomol.**
immobilization in sensors)
- IT Plastics, analysis
RL: ARU (Analytical role, unclassified); NUU (Other use, unclassified); RCT (Reactant); ANST (Analytical study); RACT (Reactant or reagent); USES (Uses)
(thermoplastics; refunctionalized oxyfluorinated surfaces for **biomol.** **immobilization** in sensors)
- IT Plastics, analysis
RL: ARU (Analytical role, unclassified); NUU (Other use, unclassified); RCT (Reactant); ANST (Analytical study); RACT (Reactant or reagent); USES (Uses)
(thermosetting; refunctionalized oxyfluorinated surfaces for **biomol.** **immobilization** in sensors)
- IT 57-13-6, Urea, analysis
RL: ANT (Analyte); ANST (Analytical study)
(refunctionalized oxyfluorinated surfaces for **biomol.**
immobilization in sensors)
- IT 9002-13-5D, Urease, **immobilized**
RL: ARG (Analytical reagent use); DEV (Device component use); RCT

- (Reactant); ANST (Analytical study); RACT (Reactant or reagent); USES (Uses)
(refunctionalized oxyfluorinated surfaces for biomol. immobilization in sensors)
- IT 27072-45-3, FITC
RL: ARG (Analytical reagent use); RCT (Reactant); ANST (Analytical study); RACT (Reactant or reagent); USES (Uses)
(refunctionalized oxyfluorinated surfaces for biomol. immobilization in sensors)
- IT 7429-90-5, Aluminum, analysis 7440-02-0, Nickel, analysis 7440-06-4, Platinum, analysis 7440-50-8, Copper, analysis 7440-57-5, Gold, analysis 9002-86-2, PVC 9003-53-6, Polystyrene 12597-69-2D, Steel, alloys, analysis
RL: ARU (Analytical role, unclassified); DEV (Device component use); ANST (Analytical study); USES (Uses)
(refunctionalized oxyfluorinated surfaces for biomol. immobilization in sensors)
- IT 9011-14-7D, Polymethyl methacrylate, surface fluorinated
RL: ARU (Analytical role, unclassified); DEV (Device component use); NUU (Other use, unclassified); ANST (Analytical study); USES (Uses)
(refunctionalized oxyfluorinated surfaces for biomol. immobilization in sensors)
- IT 9002-84-0, PTFE 9002-88-4, Polyethylene 24937-79-9, PVDF
RL: ARU (Analytical role, unclassified); NUU (Other use, unclassified); RCT (Reactant); ANST (Analytical study); RACT (Reactant or reagent); USES (Uses)
(refunctionalized oxyfluorinated surfaces for biomol. immobilization in sensors)
- IT 9036-88-8, Mannan
RL: BPR (Biological process); BSU (Biological study, unclassified); BIOL (Biological study); PROC (Process)
(refunctionalized oxyfluorinated surfaces for biomol. immobilization in sensors)
- IT 11028-71-0D, Con A, immobilized
RL: BPR (Biological process); BSU (Biological study, unclassified); RCT (Reactant); BIOL (Biological study); PROC (Process); RACT (Reactant or reagent)
(refunctionalized oxyfluorinated surfaces for biomol. immobilization in sensors)
- IT 50-00-0, Formaldehyde, reactions 67-56-1, Methanol, reactions 76-16-4 76-19-7, Perfluoropropane 77-77-0, Vinyl sulfone 116-15-4 302-04-5D, Isothiocyanate, fluorescent compds. containing 919-30-2, APTES 1333-74-0, Hydrogen, reactions 2530-83-8 4420-74-0, 3-Mercaptopropyltrimethoxysilane 7732-18-5, Water, reactions 27070-61-7, Hexafluoropropane
RL: RCT (Reactant); RACT (Reactant or reagent)
(refunctionalized oxyfluorinated surfaces for biomol. immobilization in sensors)

L36 ANSWER 42 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1995:792912 HCAPLUS

DOCUMENT NUMBER: 123:193076

TITLE: Heterobifunctional crosslinking agents for
immobilizing molecules on plastic
substrates

INVENTOR(S): Pegg, Randall K.; Saunders, Mary S.

PATENT ASSIGNEE(S): Nucleic Assays Corp., USA

SOURCE: U.S., 9 pp. Cont.-in-part of U.S. 5,279,955.
CODEN: USXXAM

DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 3
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|------|----------|-----------------|-------------|
| US 5436147 | A | 19950725 | US 1993-78753 | 19930616 |
| US 5279955 | A | 19940118 | US 1991-663120 | 19910301 |
| US 5663318 | A | 19970902 | US 1995-381231 | 19950131 |
| PRIORITY APPLN. INFO.: | | | US 1991-663120 | A2 19910301 |
| | | | US 1993-78753 | A2 19930616 |

AB Heterobifunctional crosslinking agents are synthesized that covalently link mols. such as enzymes, cells, proteins and nucleic acids to a plastic **substrate**. The agents contain a central ring structure having a **hydrophobic** hydrocarbon chain that binds to a plastic **substrate** and distal to the **hydrophobic** chain one or more **hydrophilic** chains terminating in a reactive group that covalently binds the mol. **Immobilized** mols. are useful in diagnostic assays or bioreactors. One preferred heterobifunctional crosslinking agent that is prepared is succinylolivetol-N-hydroxysuccinimide.

IC ICM C12N011-06
 ICS G01N033-549; C07C069-34
 NCL 435181000

CC 9-15 (Biochemical Methods)
 Section cross-reference(s): 27

ST heterobifunctional crosslinking agent biopolymer **immobilization** plastic; cell **immobilization** plastic crosslinking agent; bioreactor cell **biomol immobilization** plastic; clin analysis **biomol** cell **immobilization** plastic

IT Cell
Immobilization, biochemical
 Immunoassay
 Laboratory ware
 Polymer-supported reagents
 (heterobifunctional crosslinking agents for **immobilizing biomols.** on plastic)

IT Amino acids, reactions
 Antibodies
 Biopolymers
 Deoxyribonucleic acids
 Enzymes
 Nucleic acids
 Pharmaceuticals
 Proteins, reactions
 Ribonucleic acids
 RL: ARG (Analytical reagent use); RCT (Reactant); ANST (Analytical study); RACT (Reactant or reagent); USES (Uses)
 (heterobifunctional crosslinking agents for **immobilizing biomols.** on plastic)

IT Plastics
 RL: NUU (Other use, unclassified); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
 (heterobifunctional crosslinking agents for **immobilizing biomols.** on plastic)

IT Polycarbonates, reactions
 RL: NUU (Other use, unclassified); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)

(heterobifunctional crosslinking agents for **immobilizing biomols. on plastic**)

IT Polysulfones, reactions
 RL: NUU (Other use, unclassified); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
 (heterobifunctional crosslinking agents for **immobilizing biomols. on plastic**)

IT Crosslinking agents
 (heterobifunctional, heterobifunctional crosslinking agents for **immobilizing biomols. on plastic**)

IT Antibodies
 RL: ARG (Analytical reagent use); RCT (Reactant); ANST (Analytical study); RACT (Reactant or reagent); USES (Uses)
 (monoclonal, heterobifunctional crosslinking agents for **immobilizing biomols. on plastic**)

IT Nucleotides, reactions
 RL: ARG (Analytical reagent use); RCT (Reactant); ANST (Analytical study); RACT (Reactant or reagent); USES (Uses)
 (poly-, heterobifunctional crosslinking agents for **immobilizing biomols. on plastic**)

IT Vinyl compounds, reactions
 RL: NUU (Other use, unclassified); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
 (polymers, heterobifunctional crosslinking agents for **immobilizing biomols. on plastic**)

IT 57-68-1, Sulfamethazine
 RL: ANT (Analyte); ANST (Analytical study)
 (heterobifunctional crosslinking agents for **immobilizing biomols. on plastic**)

IT 9003-99-0, Peroxidase
 RL: ARG (Analytical reagent use); RCT (Reactant); ANST (Analytical study); RACT (Reactant or reagent); USES (Uses)
 (heterobifunctional crosslinking agents for **immobilizing biomols. on plastic**)

IT 9002-88-4, Polyethylene 9003-07-0, Polypropylene 9003-53-6, Polystyrene 9003-53-6D, Polystyrene, aminated 24937-78-8, Polyethylene-vinyl acetate 25087-26-7
 RL: NUU (Other use, unclassified); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
 (heterobifunctional crosslinking agents for **immobilizing biomols. on plastic**)

IT 153719-47-2P
 RL: NUU (Other use, unclassified); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)
 (heterobifunctional crosslinking agents for **immobilizing biomols. on plastic**)

IT 168062-25-7P 168062-27-9P
 RL: NUU (Other use, unclassified); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
 (heterobifunctional crosslinking agents for **immobilizing biomols. on plastic**)

IT 108-30-5, Succinic anhydride, reactions 108-55-4, Glutaric anhydride 500-66-3, 1,3-Benzenediol, 5-pentyl 645-88-5 7803-49-8, Hydroxylamine, reactions 168062-28-0
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (heterobifunctional crosslinking agents for **immobilizing biomols. on plastic**)

IT 168062-22-4P 168062-23-5P 168062-24-6P 168062-26-8P 168062-29-1P
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT

(Reactant or reagent)
(heterobifunctional crosslinking agents for **immobilizing**
biomols. on plastic)

L36 ANSWER **(43)** OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1995:646521 HCAPLUS

DOCUMENT NUMBER: 123:92664

TITLE: Treatment of oil in water emulsions by
ceramic-supported polymeric membranes

AUTHOR(S): Castro, Robert P.; Cohen, Yoram; Monbouquette, Harold
G.

CORPORATE SOURCE: Dep. Chem. Eng., Univ. California, Los Angeles, CA,
90024, USA

SOURCE: Critical Issues in Water and Wastewater Treatment,
Proceedings of the National Conference on
Environmental Engineering -- Boulder, Colo., July
11-13, 1994 (1994), 82-9. Editor(s): Ryan, Joseph N.;
Edwards, Marc. American Society of Civil Engineers:
New York, N. Y.

CODEN: 61POAU

DOCUMENT TYPE: Conference

LANGUAGE: English

AB A novel membrane was developed by growing polymer chains from the surface of a porous ceramic support, resulting in a composite membrane which combines the mech. properties of the inorg. membrane with the selective interactions of the polymer. The configuration of the grafted **polymer brush** layer is determined by solvent-polymer interactions, with a **hydrophilic** polymer being stretched away from the surface by aqueous solns. and collapsed against the surface by organic solvents. This behavior of the grafted chains provides ceramic-supported polymeric (CSP) membranes with unique properties for certain water treatment applications. One application envisioned for these CSP membranes, in which selectivity is affected by interactions between the solvent and the grafted polymer, is cross-flow filtration of an oil-in-water emulsion. In this case, a **hydrophilic** grafted polyvinylpyrrolidone (PVP) brush layer expanded into the pore volume due to the affinity of polymer for water. These extended grafted chains preferentially allow the passage of water over oil, producing a permeate stream with a lower total organic C content compared to an unmodified membrane. Another advantage of the CSP membrane is in reducing permeate flux decline believed to be caused by the adsorption of oil onto the membrane surface. For the PVP-modified CSP membrane, the grafted polymer alters the membrane surface character from **hydrophobic**, reducing the tendency for oil adsorption. This phenomenon was demonstrated by comparison of permeate flow rate behavior for both unmodified and graft polymerized (CSP) membranes.

CC 61-5 (Water)

Section cross-reference(s): 36, 57

ST water purifn emulsion breaking polymeric membrane; ceramic supported polymeric membrane sepn filtration; oil in water emulsion sepn filtration; **silica** membrane polyvinylpyrrolidone graft polymn

IT Polymerization

(graft, grafting poly(vinylpyrrolidone) polymer on **silica**
ceramic membrane to remove oil-in-water emulsions by separation-filtration)

IT 7631-86-9, **Silica**, uses 9003-39-8, Poly(vinylpyrrolidone)

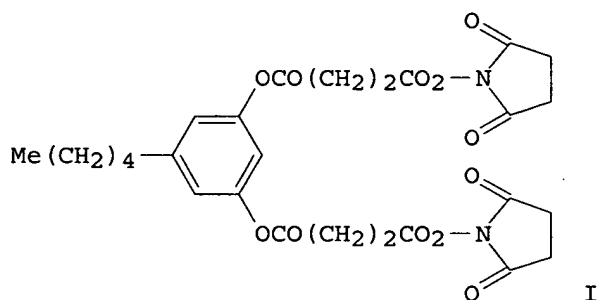
RL: DEV (Device component use); NUU (Other use, unclassified); TEM
(Technical or engineered material use); USES (Uses)

(removal of oil-in-water emulsions by ceramic-supported polymeric
membrane separation-filtration)

L36 ANSWER 44 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN
 ACCESSION NUMBER: 1994:212065 HCAPLUS
 DOCUMENT NUMBER: 120:212065
 TITLE: Synthesis of heterofunctional crosslinking agents such
 as succinyl-olivetol-N-hydroxysuccinimide for
immobilizing reagents on plastic
substrates
 INVENTOR(S): Pegg, Randall K.; Saunders, Mary S.
 PATENT ASSIGNEE(S): USA
 SOURCE: U.S., 6 pp.
 CODEN: USXXAM
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 3
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|------|----------|-----------------|-------------|
| US 5279955 | A | 19940118 | US 1991-663120 | 19910301 |
| US 5436147 | A | 19950725 | US 1993-78753 | 19930616 |
| US 5663318 | A | 19970902 | US 1995-381231 | 19950131 |
| PRIORITY APPLN. INFO.: | | | US 1991-663120 | A2 19910301 |
| | | | US 1993-78753 | A2 19930616 |

GI



AB Heterofunctional crosslinking agents are synthesized that covalently link mols. such as enzymes, cells, proteins and nucleic acids to a plastic **substrate**. The agents contain a central ring structure having a **hydrophobic** hydrocarbon chain that binds to a plastic **substrate** and, distal to the **hydrophobic** chain, ≥ 1 **hydrophilic** chains terminating in a reactive group that covalently binds the mol. **Immobilized** mols. are useful in diagnostic assays or bioreactors. A preferred heterofunctional crosslinking agent is succinyl-olivetol-N-hydroxysuccinimide (I), which contains a **hydrophobic** member for bonding agent to a **glass substrate**, and **hydrophilic** members having a terminal reactive group for binding a reagent. I is prepared by reacting succinic anhydride with 5-pentyl resorcinol and condensing carboxylic acid groups with N-hydroxysuccinimide. I greatly increased the binding of an anti-sulfamethazine antibody on microtiter plates.

IC ICM C12N011-06
 ICS G01N033-549; C07C069-34
 NCL 435181000

- CC 9-14 (Biochemical Methods)
Section cross-reference(s): 27
- ST **biomol immobilization** heterofunctional crosslinking agent; plastic **substrate biomol immobilization**; succinylolivetol hydroxysuccinimide **biomol immobilization**
- IT Plastics
Polycarbonates, reactions
Polysulfones, reactions
RL: ANST (Analytical study)
(**biomol. immobilization** on, with heterofunctional crosslinking agent)
- IT Immunoassay
(heterofunctional crosslinking agent or **biomol. immobilization** on plastic **substrate** for)
- IT Animal cell
Microorganism
Pharmaceuticals
Plant cell
(**immobilization** of, on plastic **substrate** with heterofunctional crosslinking agent)
- IT Amino acids, reactions
Antibodies
Enzymes
Nucleic acids
RL: RCT (Reactant); RACT (Reactant or reagent)
(**immobilization** of, on plastic **substrate** with heterofunctional crosslinking agent)
- IT **Immobilization, biochemical**
(of **biomol.**, on plastic **substrate**, heterofunctional crosslinking agent for)
- IT Reactors
(biocatalytic, heterofunctional crosslinking agent or **biomol. immobilization** on plastic **substrate** for)
- IT Analysis
(clin., heterofunctional crosslinking agent or **biomol. immobilization** on plastic **substrate** for)
- IT Antibodies
RL: RCT (Reactant); RACT (Reactant or reagent)
(monoclonal, **immobilization** of, on plastic **substrate** with heterofunctional crosslinking agent)
- IT Vinyl compounds, polymers
RL: ANST (Analytical study)
(polymers, **biomol. immobilization** on, with heterofunctional crosslinking agent)
- IT 9002-88-4, Polyethylene 9002-88-4D, Polyethylene, derivs. 9003-07-0, Polypropylene 9003-07-0D, Polypropylene, derivs. 25087-26-7, Polymethacrylate 25087-26-7D, Polymethacrylate, derivs.
RL: ANST (Analytical study)
(**biomol. immobilization** on, with heterofunctional crosslinking agent)
- IT 153719-47-2P
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of, for heterofunctional crosslinking agent, for **biomol. immobilization** on plastic **substrate**)
- IT 108-30-5P, Succinic anhydride, reactions
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(reaction of, with pentyl resorcinol, in heterofunctional crosslinking

agent preparation, for **biomol. immobilization** on plastic substrate)

IT 500-66-3P, 5-Pentyl resorcinol
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
 (reaction of, with succinic anhydride and hydroxysuccinimide, in heterofunctional crosslinking agent preparation, for **biomol. immobilization** on plastic substrate)

L36 ANSWER 45 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1989:54132 HCAPLUS

DOCUMENT NUMBER: 110:54132

TITLE: Functionalization of particulate bonded phase chromatographic supports prepared by silanization of **silica** gel or controlled pore **glass** and containing pendant primary alkyl amine groups

INVENTOR(S): Stolowitz, Mark L.; Taketomo, Amy Gwyn

PATENT ASSIGNEE(S): Analytichem International, Inc., USA

SOURCE: PCT Int. Appl., 24 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|------|----------|-----------------|----------|
| WO 8706586 | A1 | 19871105 | WO 1987-US901 | 19870421 |
| W: JP | | | | |
| RW: AT, BE, CH, DE, FR, GB, IT, LU, NL, SE | | | | |
| US 4837348 | A | 19890606 | US 1986-859148 | 19860430 |
| EP 265495 | A1 | 19880504 | EP 1987-903147 | 19870421 |
| R: AT, BE, CH, DE, FR, GB, IT, LI, LU, NL, SE | | | | |

PRIORITY APPLN. INFO.: US 1986-859148 A 19860430

AB Functionalization results from the activation of the amines by reaction with N,N'-carbonyldiimidazole (CDI), or a related azolide, in anhydrous organic solvent, followed by derivatization of the support. Derivatization results from reaction of the activated support with a functionalizing reagent consisting of a primary or secondary, alkyl or arylamine in an organic solvent, or from an aqueous solution of the amine or its salt. A urea linkage results through which the functionalizing reagent is covalently attached to the support. Derivatization can result from addition of an excess of a single reagent, or as a consequence of the sequential addition of ≥ 2 functionalizing reagents. Chromatog. support preparation in this manner yields materials suitable for affinity, covalent, ion-exchange, and hydrophobic interaction chromatog. of **biomols.** as well as for the preparation of **immobilized** reagents. The residual silanol activity associated with the particulate **silica** or controlled pore **glass substrate** is effectively masked by application of a **hydrophilic** barrier. This eliminates the irreversible adsorption of biol. macromols. and low mol. weight amines observed with bonded phase supports which are not further derivatized. The effective **hydrophilic** barrier results in masking residual silanol activity and the **hydrophobic** nature of the silane backbone. Aminopropyl **silica** gel was activated with CDI and triethylamine in CH₂Cl₂ and the activated gel was filtered and washed and treated with glycine in 0.1 N NaCO₃ buffer to give N-carboxymethyl-N'-propylsilylurea **silica** for preparative ion exchange chromatog.

IC ICM C07F007-10

- CC 9-3 (Biochemical Methods)
- ST particulate bonded phase chromatog support functionalization; affinity chromatog support functionalization; ion exchange chromatog support functionalization; **hydrophobic** interaction chromatog support functionalization
- IT **Silica** gel, compounds
RL: SPN (Synthetic preparation); PREP (Preparation)
(aminopropylated, reaction products, with carbonyldiazolides and functionalizing groups, preparation of, as chromatog. resin)
- IT Chromatography, column and liquid
(**hydrophobic**, particulate bonded phase supports for, functionalization of)
- IT 530-62-1D, N,N'-Carbonyldiimidazole, reaction products with aminopropyl **silica** gel 6160-65-2D, N,N'-Thiocarbonyldiimidazole, reaction products with aminopropyl **silica** gel 14667-54-0D, reaction products with aminopropyl **silica** gel 37868-93-2D, reaction products with aminopropyl **silica** gel 41864-22-6D, reaction products with aminopropyl **silica** gel 43183-39-7D, reaction products with aminopropyl **silica** gel 65610-66-4D, reaction products with aminopropyl **silica** gel 68985-05-7D, reaction
RL: ANST (Analytical study)
(in functionalization of particulate bonded phase chromatog. supports prepared by silanization)
- IT 56-12-2, 4-Aminobutyric acid, reactions 56-40-6, Glycine, reactions 60-23-1, Cysteamine 60-32-2, 6-Aminohexanoic acid 64-04-0, Phenethylamine 77-86-1 79-17-4, Aminoguanidine 107-35-7, Taurine 109-73-9, n-Butylamine, reactions 111-74-0 111-86-4, n-Octylamine 124-09-4, 1,6-Diaminohexane, reactions 556-50-3, Diglycine 1122-90-3 6283-24-5 27598-85-2, Aminophenol 89415-43-0
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of, with activated aminopropyl **silica** gel, in preparation of chromatog. resin)
- IT 919-30-2, 3-Aminopropyltriethoxysilane 3069-30-5, 4-Aminobutyltriethoxysilane 3663-43-2 5089-72-5 13822-56-5, 3-Aminopropyltrimethoxysilane 118406-69-2
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of, with activated **silica**, in preparation of functionalized bonded phase chromatog. supports)

L36 ANSWER 46 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1986:80433 HCAPLUS

DOCUMENT NUMBER: 104:80433

TITLE: Aqueous electrically conductive compositions

INVENTOR(S): Friedli, Hans R.; Lau, Philip Y.

PATENT ASSIGNEE(S): Dow Chemical Co., USA

SOURCE: U.S., 3 pp.
CODEN: USXXAM

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|------|----------|-----------------|----------|
| US 4556506 | A | 19851203 | US 1984-682961 | 19841218 |
| PRIORITY APPLN. INFO.: | | | US 1984-682961 | 19841218 |
| AB An aqueous elec. conductive coating composition contains (1) a bisphenol A tetramethylene sulfonium zwitterionic monomer 0.3-15; (2) an alkali metal | | | | |

salt of partially hydrolyzed (6-10%) **polyacrylamide** (weight-average mol. weight 200,000-500,000) 5-20; (3) a nonionic surfactant (having HLB value of 11-15) 0.5-20; (4) metallic particles (flakes and powders of Ni, Cu, Al or their combination) 20-60 weight%; and (5) balance H₂O. Among suitable surfactants, 2,4,7,9-tetramethyl-4,7-dihydroxy-5-decyne is included. Thus, a composition containing **polyacrylamide** 2.14, zwitterion monomer 8.15, surfactant (Surfynol 104) 3.97, Ni flakes 45, and H₂O 40.39 weight% was **brushed** on a **polystyrene** plaque and cured. The coating had a resistivity of 0.342 Ω -cm with a thickness of 0.09 mm. Other polymer **substrates** can also be used. The composition does not cause air pollution during application and is useful in the preparation of conductive adhesives, conductive inks, conductive tapes, printed circuits, and electromagnetic and radio-frequency shielding.

IC ICM H01B001-22

NCL 252512000

CC 76-2 (Electric Phenomena)

Section cross-reference(s): 38

ST aq elec conductive coating compn; **polyacrylamide** coating compn; **acrylamide** polymer coating compn; metal particle elec conductive coating compn; bisphenol A zwitterion conducting coating; **polystyrene** elec conductive coating; **styrene** polymer elec conductive coating; methylene sulfonium zwitterion conductive coating; sulfonium tetramethylene zwitterion conductive coating

IT Electric conductors

(**polyacrylamide** coating compns., containing metal particles and zwitterion monomers and surfactants)

IT 80-05-7D, tetramethylene sulfonium derivative 126-86-3

RL: USES (Uses)

(elec. conductive coatings from **polyacrylamide** containing)

IT 7429-90-5, uses and miscellaneous 7440-02-0, uses and miscellaneous 7440-50-8, uses and miscellaneous

RL: USES (Uses)

(elec. conductive coatings from **polyacrylamide** containing flakes of)

IT 9003-53-6

RL: USES (Uses)

(elec. conductive coatings on, from **polyacrylamide** containing metallic particles and zwitterion monomers and surfactants)

L36 ANSWER 47 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1985:414571 HCAPLUS

DOCUMENT NUMBER: 103:14571

TITLE: Ethylenically-unsaturated dextrin composition for preparing a durable **hydrophilic** photopolymer

INVENTOR(S): Fohrenkamm, Elsie A.; Rousseau, Alan D.

PATENT ASSIGNEE(S): Minnesota Mining and Manufacturing Co., USA

SOURCE: U.S., 9 pp.

CODEN: USXXAM

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|--|----------|-----------------|----------|
| US 4511646 | A | 19850416 | US 1983-471828 | 19830303 |
| PRIORITY APPLN. INFO.: | | | US 1983-471828 | 19830303 |
| AB | A photopolymeric composition useful for preparation of a hydrophilic layer in a pos.-acting H ₂ O-developable lithog. plates consists of | | | |

(1) an ethylenically unsatd. dextrin oligomer, (2) ≥ 1 hydroxyfunctional **acrylamide** monomer, (3) an inorg. solid particulate filler material, and (4) a photoinitiator system. Thus, a **brush-grained** Al support was coated with a composition containing an ethylenically unsatd. urethane oligomer 9.1, diphenyliodonium hexafluorophosphate 0.4, Michler's ketone 0.4, 2-methacryloyloxyethyl phosphate 0.1, 1,1,2-trichloroethylene 10, MeCOEt 10, quartz (8 μ m particles) treated with 5% μ -methoxyacryloxypropyltrimethoxysilane 10 g, dried, cured with Hg metal halide lamp irradiation, overcoated with a dispersion containing **acrylamidomethyl dextrin** (prepared by reaction of Stadex 140 with N-methylolacrylamide in the presence of **acrylic acid** and phenothiazine) 3, H₂O 27, 1,3-diacrylamide-2-hydroxyprone 1.3, 31% aqueous 1-**acrylamido**-2,3-dihydroxypropane 2.1 g, 10% aqueous triethylamine (to adjust pH to 8.5), 10% aqueous Triton X-100 0.2, Colamyl red (50% solids) 0.9, Syloid 244 1.93, 2% 4,4'-bis(N-2-carboxyethyl-N-methylamino)benzophenone di-Na salt 7.7, diphenyliodonium hexafluorophosphate 0.1 g, dried, imagewise exposed, H₂O developed and mounted on a Miehle sheet fed press and an abrasive ink was used to print copies. After 33,000 impressions the only sign of wear was a darkening in the 95 and 97% screens.

IC ICM G03C001-70

ICS C08L003-02

NCL 430283000

CC 74-4 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

ST lithog photopolymer unsatd dextrin oligomer; **hydrophilic layer** lithog printing plate

IT Lithographic plates

(photopolymeric composition for preparation of durable **hydrophilic layers** of, ethylenically-unsatd. dextrin oligomer for)

IT **Silica** gel, uses and miscellaneous

RL: PREP (Preparation)

(photopolymeric composition for preparation of **hydrophilic layer** of lithog. printing plate containing, ethylenically-unsatd. dextrin oligomer for)

IT 924-42-5

RL: USES (Uses)

(photopolymeric composition for **hydrophilic layer** of lithog. printing plate containing, photoinitiator system for, consisting of free radical initiator and Michler's ketone analog sensitizer)

IT 90-94-8 100-61-8, uses and miscellaneous 2530-85-0 **7631-86-9**

, uses and miscellaneous **14808-60-7**, uses and miscellaneous

24599-21-1 79771-30-5

RL: USES (Uses)

(photopolymeric composition for **hydrophobic layer** of lithog. plate containing, photopolymeric composition for **hydrophilic layer** for, containing ethylenically-unsatd. dextrin oligomer)

IT 42521-68-6 58109-40-3 90698-35-4 91576-33-9 96603-26-8

RL: USES (Uses)

(photopolymeric composition for preparation of **hydrophilic layer** of lithog. plate containing ethylenically-unsatd. dextrin oligomer and)

IT 924-42-5D, reaction product with dextrin 9004-53-9D, reaction product with methylolacrylamide

RL: USES (Uses)

(photopolymeric composition for preparation of **hydrophilic layer** of lithog. printing plate containing)

IT 9004-53-9D, reaction product with methylolacrylamide

RL: USES (Uses)

(photopolymeric composition for preparation of **hydrophilic layer** of lithog. printing plate containing, photoinitiator system for)

L36 ANSWER 48 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1984:53307 HCAPLUS
DOCUMENT NUMBER: 100:53307
TITLE: Asphalt emulsions containing crosslinkable polymers
PATENT ASSIGNEE(S): Badische Petrochemical Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 11 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|------|----------|-----------------|----------|
| JP 58127760 | A2 | 19830729 | JP 1982-10388 | 19820126 |
| PRIORITY APPLN. INFO.: | | | JP 1982-10388 | 19820126 |

AB Emulsions giving coatings with heat and creep resistance and low-temperature flexibility contain carbonyl group-containing copolymer with **glass** temperature $\leq 30^\circ$, a compound containing ≥ 2 hydrazine groups (0.02-1 mol N_2H_4 /carbonyl group), and 2-560 phr asphalt. Thus, a 48% polymer [86002-37-1] emulsion (**glass** temperature -17°) was prepared from **styrene** 240, 2-ethylhexyl acrylate 215, **acrylic acid** 10, acrolein 25, and **acrylamide** 10 parts neutralized with NH_3 . A 35:65 mixture (as solids) of this emulsion and an emulsion of asphalt (softening point -75°) 62, xylene 15, nonionic surfactant 2, and water 21% containing 0.5 equivalent adipic acid dihydrazide [1071-93-8]/carbonyl group was cast on **glass** and dried at room temperature for 7 days and at 40° for 2 days to give a 1.5-mm film with tensile strength 5.6 kg/cm², elongation 650% (after 1 day at 20°) or 240% (after 1 h at 5°), creep 5.5% (after 7 h at 80°), residual strain 50% (after 2:1 stretching at 20° and 65% relative humidity for 4 days) and good roller and **brush** coatability, compared with 2.0 kg/cm², 190%, too brittle to measure, breakage after 15 min, and unmeasurable, resp., without copolymer or hydrazide.

IC C08L095-00; C08K005-24; C08L057-10
ICA C09D003-24
CC 42-7 (Coatings, Inks, and Related Products)
Section cross-reference(s): 51
ST **acrylic acid** copolymer coating; acrylate copolymer coating; acrolein copolymer coating; **acrylamide** copolymer coating; **styrene** copolymer coating; adipic acid hydrazide coating; hydrazide asphalt emulsion coating

L36 ANSWER 49 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1982:113494 HCAPLUS
DOCUMENT NUMBER: 96:113494
TITLE: Laminating a supported photosensitive layer to a **substrate**
INVENTOR(S): Weiner, Jerold Samuel; Small, Samuel
PATENT ASSIGNEE(S): du Pont de Nemours, E. I., and Co., USA
SOURCE: Eur. Pat. Appl., 28 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|------|----------|-----------------|----------|
| EP 40842 | A1 | 19811202 | EP 1981-103965 | 19810523 |
| EP 40842 | B1 | 19840815 | | |
| R: AT, BE, CH, DE, FR, GB, IT, LU, NL, SE | | | | |
| BR 8103186 | A | 19820209 | BR 1981-3186 | 19810522 |
| AT 9043 | E | 19840915 | AT 1981-103965 | 19810523 |
| ZA 8103495 | A | 19830126 | ZA 1981-3495 | 19810525 |
| CA 1168140 | A1 | 19840529 | CA 1981-378307 | 19810526 |
| JP 57021891 | A2 | 19820204 | JP 1981-81816 | 19810527 |
| JP 01043943 | B4 | 19890925 | | |

PRIORITY APPLN. INFO.:
US 1980-153637 A 19800527
EP 1981-103965 A 19810523

AB The lamination of a photosensitive layer to a support useful in printed circuit fabrication and lithog. plate production comprises formation of a thin interface layer of H₂O between a support and a photosensitive layer (the interface is later absorbed by the photosensitive layer during lamination process). Thus, a **surface** of a support made of fiberglass-reinforced epoxy resin and Cu clad cleaned by mech. scrubbing in a heavy spray of H₂O was wetted with finely divided droplets of H₂O by an air **brush** and laminated with a photoresist film (obtained by coating 0.00127 cm thick poly(ethylene terephthalate) web containing on its reverse side a thin layer of Carnuba wax and poly(vinylidene chloride) with a composition containing **styrene**-maleic anhydride copolymer partially esterified with iso-Bu alc. 40, Et acrylate-Me methacrylate-**acrylic acid** copolymer 12.6, N-tert-octyl **acrylamide**-Me methacrylate-**acrylic acid** -hydroxypropyl methacrylate-tert-butylaminoethyl methacrylate copolymer 5, polyoxyethylated trimethylpropane 10, trimethylpropane triacrylate 12.5, benzophenone 4, 4,4'-bis(dimethylamino)benzophenone 0.7, 2,2'-bis(2-chlorophenyl)-4,4',5,5'-tetraphenylbiimidazole 3, leuco crystal violet 0.4, benzotriazole 0.2, 1,4,4-trimethyl-2,3-diazabicyclo-[3.2.2]-non-2-ene-2,3-dioxide 0.06, Victoria Green 0.03, CH₂Cl₂ 200, MeOH 15, polyethylene beads (85% of which had diams. <10 and 15% had diams. 10-20) 13 weight parts to give 0.00254 cm dry layer) by hot nip rolls at 230°F to give a product with excellent lamination.

IC G03F007-16; G03C001-74

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

L36 ANSWER 50 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1980:95743 HCAPLUS

DOCUMENT NUMBER: 92:95743

TITLE: **Silica** coating compositions

INVENTOR(S): Miyosawa, Yoshiaki

PATENT ASSIGNEE(S): Kansai Paint Co., Ltd., Japan

SOURCE: Jpn. Tokkyo Koho, 8 pp.

CODEN: JAXXAD

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 2

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|-------------|------|----------|-----------------|----------|
| JP 54022230 | B4 | 19790804 | JP 1976-86167 | 19760720 |

JP 53011989 A2 19780202
GB 1562651 A 19800312 GB 1977-30330 19770719
DE 2732753 A1 19780126 DE 1977-2732753 19770720
DE 2732753 B2 19791004
DE 2732753 C3 19800619
CA 1090551 A1 19801202 CA 1977-283148 19770720
US 4330446 A 19820518 US 1979-39954 19790517
PRIORITY APPLN. INFO.: JP 1976-86167 A 19760720
JP 1977-7107 A 19770125
JP 1977-36545 A 19770331
JP 1977-38354 A 19770404
US 1977-816969 A1 19770719

AB Water-thinned **silica** compns. forming hard, transparent coatings with excellent abrasion, fire, and corrosion resistance contained hydroxy and carboxy group-containing acrylic polymers and silane derivs. Thus, a composition from 20% aqueous 24:15:140:38:68:15 **acrylic acid** -N-(butoxymethyl)**acrylamide**-Et acrylate-2-hydroxyethyl acrylate-Me methacrylate-**styrene** copolymer 2-(dimethylamino)ethanol salt [71926-43-7] 375, Snowtex N 125, and KBM 503 [2530-85-0] 1.5 g was **brushed** onto steel and baked 30 min at 180° to give a coating with pencil hardness 4 H, adhesion (cross-cut) 95/100, water resistance 216 h, abrasion 30 mg, and flammability test carbonization only, compared with HB, 60/100, 144 h, 65 mg, and inflammation with cracking, resp., for a control without KBM 503.

IC C08F008-42
CC 42-10 (Coatings, Inks, and Related Products)
Section cross-reference(s): 55
ST acrylic coating **silica** silane deriv; fire resistant acrylic **silica** coating
IT Coating materials
(water-thinned, acrylic polymers-**silica**-silane derivs., fire-resistant, for steel)
IT 7631-86-9, uses and miscellaneous
RL: USES (Uses)
(acrylic polymer coatings containing silane derivs. and, fire-resistant, for steel)
IT 2530-83-8 2530-85-0 17985-63-6 72779-68-1
RL: USES (Uses)
(acrylic polymer coatings containing **silica** and, fire-resistant, for steel)
IT 71926-43-7 72689-08-8 72689-09-9 72860-75-4
RL: TEM (Technical or engineered material use); USES (Uses)
(coatings, containing **silica** and silane derivs., fire-resistant, for steel)

L36 ANSWER 51 OF 54 HCAPLUS. COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1969:492579 HCAPLUS
DOCUMENT NUMBER: 71:92579
TITLE: Dyeing and impression method for fibrous **substrates**
PATENT ASSIGNEE(S): Farbenfabriken Bayer A.-G.
SOURCE: Fr., 8 pp.
CODEN: FRXXAK
DOCUMENT TYPE: Patent
LANGUAGE: French
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------|------|------|-----------------|------|
|------------|------|------|-----------------|------|

FR 1525629

19680517

DE 1619478

DE

GB 1170515

GB

US 3536440

19700000

US

PRIORITY APPLN. INFO.:

DE

19660603

AB Cotton and regenerated cellulose fibers were dyed or printed fast shades with aqueous crosslinkable copolymer emulsions. Thus, 400 parts of a mixture of

Bu acrylate 56, **styrene** 30, β -hydroxypropyl methacrylate 4, **acrylamide** 2.5, and H₂C:CHCONHCH₂NHCOCH₂Cl 7.5% were added to 1:20 nonylphenol-ethylene oxide adduct 20, alkylsulfonate 2, naphthalenesulfonic acid-HCHO condensate 2, and H₂O 550 parts, 20% of the resulting emulsion was heated 10 min. under N at 55°, 0.24 part K₂S₂O₈ and 0.32 part Na₂S₂O₅, each dissolved in 5 parts H₂O added, the remaining 80% of the emulsion mixed with 0.96 part K₂S₂O₈ in 20 ml. H₂O and 1.28 parts Na₂S₂O₅ in 20 ml. H₂O and added regularly during 3 hrs. to the previous emulsion part, and the mixture held 3-4 hrs. and stirred 4 hrs. to give a 37-9% yield of non-coagulating dispersion. The dispersion (200 parts) was mixed with 30% aqueous carbon black dispersion 100, 4% aqueous tragacanth gum 50, cetyl alc.-ethylene oxide adduct 8, H₂O 182, 33% aqueous K₂CO₃ 30, and naphtha 450 parts to give a viscous paste for printing cotton-rayon fabric deep black shades. The printed fabric was dried 8 min. at 98° in the presence of steam, 5 min. at 130°, and 2 min. at 150° to give a product resistant to washing, crease, and **brushing**. Other monomers used for preparing the crosslinkable copolymers were N-(methoxymethyl)**methacrylamide**, 2-(chloroacetoxy)-1-propyl methacrylate, N-(chloroacetamidocarbonyl)methacryl amide, vinyltoluene, 2-ethylhexyl methacrylate, 2-(chloroacetoxy)-1-propyl acrylate, N-(chloroacetamidomethyl)**methacrylamide**, acrylonitrile, butadiene, and methacrylic acid. Other pigments used were perchlorinated phthalocyanine-Cu, TiO₂ and azo dyes.

IC C08F; D06P

CC 39 (Textiles)

IT Textile printing

(pastes for, **acrylamide** derivative-vinyl compound polymers containing pigments, for cellulosic textiles)

IT **Styrene**, ar-methyl-

RL: USES (Uses)

(polymers with **acrylamide** derivs. and vinyl compds., textile printing pastes from pigments and)

IT 79-41-4, Methacrylic acid, uses and miscellaneous **100-42-5**, **Styrene**, uses and miscellaneous 106-99-0, 1,3-Butadiene, uses and miscellaneous 107-13-1, Acrylonitrile, uses and miscellaneous 140-88-5, **Acrylic acid** ethyl ester 141-32-2, **Acrylic acid** butyl ester 688-84-6 923-26-2 16975-74-9 16975-75-0 21369-74-4

RL: USES (Uses)

(polymers with **acrylamide** derivs. and vinyl compds., textile printing pastes from pigments and)

IT **79-06-1, Acrylamide** 79-39-0 3644-12-0 16359-59-4 21369-72-2 21369-73-3

RL: USES (Uses)

(polymers with vinyl compds., textile printing pastes from pigments and)

L36 ANSWER (52) OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1966:508752 HCAPLUS

DOCUMENT NUMBER: 65:108752

ORIGINAL REFERENCE NO.: 65:20301h,20302a-e
 TITLE: Stabilizing polymers with alkenoylamido and alkenoyloxy-phenylbenzotriazoles against ultraviolet light
 INVENTOR(S): Millionis, Jerry P.; Hardy, William B.; Baitinger, William F., Jr.
 PATENT ASSIGNEE(S): American Cyanamid Co.
 SOURCE: 8 pp.
 DOCUMENT TYPE: Patent
 LANGUAGE: Unavailable
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------|------|----------|-----------------|----------|
| US 3272891 | | 19660913 | US | 19641014 |

GI For diagram(s), see printed CA Issue.

AB Continuation-in-part of U.S. 3,159,646 (CA 62, 7951f). The title compds. overcome solvent leaching and evaporation during heat treatment of resins, ensuring retention in the plastic **substrate** upon uv exposure. The stabilizers have the general formula I, or are the dimethylacetamide-soluble, low-viscosity homopolymers of I, in which R and R1 are lower-alkyl, alkoxy, halogen, nitro, carboxy, sulfo, or sulfonamide; R2 is alkenoylamino with a polymerizable CH2:C group; R3 is alkenoyloxy with a polymerizable CH2:C group; m and n are each 0, 1, or 2; p and q are 0, 1, 2, or 3, ≥ 1 of p and q being >0 ; and R2 and R3 are substituents on the carbocyclic rings. Synthesis of I is illustrated as follows: o-Nitroaniline (55.2 parts by weight) is diazotized with 320 parts by volume concentrated HCl and 27.6 parts by weight NaNO2. The clear diazonium chloride solution is added dropwise to a solution cooled to -5 to +5° of 65.6 parts by weight m-aminophenol in 2000 parts by volume H2O containing 120 parts by volume 5N HCl. The crude product is the HCl salt of the amine. A slurry in H2O of this azo compound is treated with dilute NaOH to give the free azo compound, which is triazoltized immediately by 78.5 parts Zn dust and 480 parts by volume 5N NaOH. Recrystn. 3 times from aqueous EtOH gives orange-red needles of 2-(4-amino-2-hydroxyphenyl)-benzotriazole (II). A slurry of 2.94 parts II in 75 parts by volume PhCl is added portionwise at -5 to 0° to 1.18 parts acrylyl chloride in 25 parts by volume PhCl to which 1.19 parts pyridine and 0.1 part hydroquinone have been added. The mixture is stirred at this temperature for a short time, then at 25-30° until reaction is complete. Recrystn. from alc. and H2O, then PhCl, yields yellow solid 2-(4-**acrylamido**-2-hydroxyphenyl)benzotriazole (III). III (0.5 g.) and 0.05 g. Bz2O2 are mixed with 4.5 g. **styrene**, sealed under N, and heated at 120° for 100 hrs. The copolymer is dissolved in PhMe, precipitated with excess EtOH, and washed with hot alc. The product contains 75 mg. III/g. of copolymer. A PhMe solution of the copolymer is **brushed** on a white pine panel. A **polystyrene** solution in PhMe is also applied to a similar panel. These 2 panels and a 3rd panel with no overcoating are placed in a Fade-Ometer for 14 hrs. The control samples became badly discolored, but the sample containing the **styrene**-III copolymer was only slightly discolored. Various other I copolymers gave similar results with **polystyrene**, acrylonitrile-**styrene** copolymers, polyester-**styrene** copolymers, poly(Bu methacrylate), poly(Me methacrylate), a butadiene-**styrene** copolymer, poly(vinyl fluoride), etc.

NCL 260895000
 CC 48 (Plastics Technology)

- IT Acrylonitrile polymers (including copolymers)
(with acryloyl derivs. of (aminohydroxyphenyl benzotriazoles and **styrene**, ultraviolet light stabilization of polymers by)
- IT 1,3-Butadiene polymers, with acrylonitrile-**styrene** polymers
(with acrylyl derivs. of (aminohydroxyphenyl)benzotriazoles and **acrylamide** or **styrene**, ultraviolet light stabilization of polymers by)
- IT 3234-12-6, p-Cresol, 2-(5-amino-2H-benzotriazol-2-yl)- 3234-16-0, **Acrylic acid**, 4-(2H-benzotriazol-2-yl)-3-hydroxyphenyl ester 3234-22-8, Resorcinol, 4-(2H-benzotriazol-2-yl)-, 1-methacrylate 3234-33-1, Phenol, 5-amino-2-(2H-benzotriazol-2-yl)- 3234-35-3, Phenol, o-(5-amino-2H-benzotriazol-2-yl)- 3234-36-4, **Acrylamide**, N-[2-(o-hydroxyphenyl)-2H-benzotriazol-5-yl]- 3322-95-0, Acrylanilide, 4'-(5-**acrylamido**-2H-benzotriazol-2-yl)-3'-hydroxy- 3322-97-2, Benzenesulfonic acid, 4-(5-**acrylamido**-2H-benzotriazol-2-yl)-3-hydroxy-
(as ultraviolet light stabilizer for polymers)
- IT 9003-54-7, Acrylonitrile, polymer with **styrene**
(color-stable)
- IT 79-10-7, **Acrylic acid**
(ester polymers, ultraviolet stabilizers for, polymers or acrylyl derivs. of (aminohydroxyphenyl)benzotriazoles as)
- IT 100-42-5, **Styrene**
(polymerization of, with acrylyl derivs. and (aminohydroxyphenyl)benzotriazoles, acrylonitrile, butadiene and polyesters)
- IT 9003-17-2, 1,3-Butadiene, homopolymer
(polymerization of, with acrylyl derivs. of (aminohydroxyphenyl)benzotriazoles and **acrylamide** or **styrene**)
- IT 79-06-1, **Acrylamide**
(polymerization of, with acrylyl derivs. of (aminohydroxyphenyl)benzotriazoles and butadiene to ultraviolet light-resistant polymer)
- IT 107-13-1, Acrylonitrile
(polymerization of, with acrylyl derivs. of (aminohydroxyphenyl)benzotriazoles and **styrene**)
- IT 9003-53-6, **Styrene** polymers
(with acrylyl derivs. of (aminohydroxyphenyl)benzotriazoles and unsatd. compds., as ultraviolet light stabilizers for polymers)

L36 ANSWER 53 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1966:85558 HCAPLUS

DOCUMENT NUMBER: 64:85558

ORIGINAL REFERENCE NO.: 64:16134h,16135a-d

TITLE: Emulsion paints that adhere to weathered painted **surfaces**

INVENTOR(S): Glavis, Frank J.; Keighley, William J.; Haag, Thomas H.

PATENT ASSIGNEE(S): Rohm & Haas Co.

SOURCE: 54 pp.

DOCUMENT TYPE: Patent

LANGUAGE: Unavailable

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------|------|----------|-----------------|-------|
| ----- | ---- | ----- | ----- | ----- |
| BE 649321 | | 19641216 | BE | |

PRIORITY APPLN. INFO.:

US

19630617

AB The paints are based upon aqueous dispersions of: (1) normally H₂O-insol. vinyl ester, acrylic ester, or vinylhydrocarbon homo- or copolymers mixed with (2) H₂O-soluble ammoniacal salts of relatively low-mol.-weight copolymers that contain 2-15% α,β -ethylenically unsatd. carboxylic acids and anionic or nonionic surfactants. A polymer unit containing ureido groups consists of $\geq 0.25\%$ by weight of the total mixture of polymers (1) and (2); of this mixture, 15-65% is (1). Thus, a mixture was prepared from 100 parts of a 49%-solids emulsion of a 55:39:5:1 copolymer of Et acrylate (I), Me methacrylate (II), N-[β -(α -methacryloyloxyacetamido)ethyl]-N,N'-ethyleneurea, and methacrylic acid (III), which contained 3% by weight of the monomers used of an emulsifier made by condensation of tert-octylphenol (IV) with 16 moles ethylene oxide (V); and 100 parts of an aqueous solution containing 20% of a copolymer made from 95%

I and 5% III by using K₂S₂O₈ as catalyst in the presence of 0.5 part Na lauryl sulfate and 2 parts dodecyl mercaptan, which was subsequently neutralized with NH₄OH; and 12 parts of the reaction product of IV with 36 moles of V. A portion of the mixture was brushed on wood covered with oil paint that had been weathered to a powdery surface; it adhered perfectly. A similar mixed polymer in which the 1st component was made from I, II, N-vinylthiopropyl-N,N'-propyleneurea, and III in a 60:29:10:1 ratio also adhered well when brush-coated over a coating that had been chalked by previous weathering. Similar results were obtained by using mixts. in which the 1st component was made by using N-methylol-N-methacryloyloxyethylurea, β -ureidoethyl vinyl ether, N-vinyl-N,N'-ethyleneurea, N-(β -methacryloylamidoethyl)-N,N'-ethyleneurea, N-methacryloylamidomethyl-N,N'-ethylene urea, N - [β - (α -methacryloyloxyacetamido)propyl]-N,N' - propyleneurea, N-[β -(β -carbomethoxyacryloylamino)ethyl]-N,N'-ethyleneurea, N-diethylaminoethyl-N'-vinyl-N,N'-ethyleneurea, and β (N,N'-ethyleneureido)ethyl acid fumarate (cf. Belg. 618,087, CA 58, 11490e); or when the 2nd component was based upon a copolymer of mol. weight 10,000 prepared from I, III, and β -ureidoethyl methacrylate in a 80:15:5 ratio. The dispersions, when pigmented according to U.S. 2,581,414 (CA 46, 3298a) were equally adherent to weathered substrates. In clear form, they were used as primers over weathered asbestos shingles, to which adherent, durable, acrylic coatings were applied.

CC 52 (Coatings, Inks, and Related Products)

IT Paint

(for weathered painted surfaces, adherent emulsion type, with NH₄ salts of ureide polymers with acrylates, methacrylates, etc.)

IT Surface-active substances

(paint containing, for weathered painted surfaces)

IT Acrylic acid, butyl ester polymers with styrene, ureides

Styrene polymers, with acrylates, ureides (etc., NH₄ salts, for paint)

IT 2-Imidazolidinethione, 1-vinyl-, homopolymer

2-Imidazolidinone 1-acetyl-, 1-[2-(dimethylamino)ethyl]-3-vinyl-, homopolymer

2-Imidazolidinone 1-acetyl-, 1-vinyl-, homopolymer

2-Imidazolidinone 1-acetyl-, methyl-1-[3-(vinylthio)propyl]-, homopolymer
Acrylamide, 2-methyl-N-[(2-oxo-1-imidazolidinyl)methyl]-, homopolymer

Acrylamide, 2-methyl-N-[2-(2-oxo-1-imidazolidinyl)ethyl]-, homopolymer

Acrylic acid, ethyl ester polymers with methacrylates

and ureides, NH₄ salts
 Glycolamide, N-[2-(2-oxo-1-imidazolidinyl)ethyl]-, methacrylate, homopolymer
 Glycolamide, N[1-methyl-2-(methyl-2-oxo-1-imidazolidinyl)ethyl]-, homopolymer
 Maleamic acid, N-[2-(2-oxo-1-imidazolidinyl)ethyl]-, methyl ester, polymers
 Methacrylic acid, 1-ester with 1-(2-hydroxyethyl)-3-(hydroxymethyl) urea, polymers
 Methacrylic acid, esters with N-[2-(2-oxo-1-imidazolidinyl)ethyl]glycolamide, polymers
 Methacrylic acid, esters with N-[2-(2-oxo-1-imidazolidinyl)ethyl]glycolamide, polymers
 Urea, (2-hydroxyethyl)-, methacrylate, polymers
 Urea, 1-(2-hydroxyethyl)-3-(hydroxymethyl)-, 1-methacrylate, polymers
 Urea, [2-(vinylloxy)ethyl]-, homopolymer
 (paint containing)

L36 ANSWER 54 OF 54 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1964:419162 HCAPLUS

DOCUMENT NUMBER: 61:19162

ORIGINAL REFERENCE NO.: 61:3308b-g

TITLE: Modified vinyl polymer coating compositions

INVENTOR(S): Shaw, Robert S.; Dupont, John A.

PATENT ASSIGNEE(S): Rohm & Haas Co.

SOURCE: 52 pp.

DOCUMENT TYPE: Patent

LANGUAGE: Unavailable

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------|------|----------|-----------------|------|
| BE 631720 | | 19631118 | BE | |
| FR 1363352 | | | FR | |
| GB 1007723 | | | GB | |
| US 3258438 | | 1966 | US | |

PRIORITY APPLN. INFO.: US 19620501

AB A stable polymeric dispersion is produced, as particles of size 0.1-2 μ , in an essentially aliphatic hydrocarbon solvent (b. -50 to 520°), when a vinyl monomer (I) or mixture of monomers is added to a mixture of a linear polyester (II), modified by a drying oil, and a polyacrylate (III), soluble in that oil, at a temperature from room to 125°, in the presence of a conventional initiator. I include monomers which, when polymerized or copolymerized, give a polymer insol. in aliphatic hydrocarbon solvents, e.g. acrylonitrile, **acrylic acid**, methacrylic acid, itaconic acid, and their esters with C1-4 alcs.; II consist, e.g., of 60% polyester of phthalic acid and glycerol in linoleic acid or 75% polyester of terephthalic acid and trimethylolethane in linseed oil; and III of polyesters of acrylic and methacrylic acids with C4-18 alcs. The amount of the mixture of II (modified) and HI (weight ratio 90:10-10:90) is 5-20% by weight of the total of monomer and mixture, and the amount of solvent is such as to give a 5-40% or more of a solution of the mixture

of II (modified) and III. The amount of initiator is 0.001-10% by weight of I. II and (or) III may be modified by $\leq 20\%$ of a vinyl monomer containing a polar group, e.g. **acrylic acid**, methacrylic acid, maleic anhydride, or **acrylamide**. This modifier and II or III are heated at 45-150° for 5 hrs. with an initiator to produce a graft copolymer. A small amount (<25%) of aromatic vinyl monomer, e.g.

styrene, or higher esters of acrylic or methacrylic acids may be incorporated, provided that the product is still insol. The viscosity of the dispersion is 0.3-10 poises at ambient temperature and 40% concentration, and the dry extract 1-55% of the solution. The dispersion may be used to impregnate or coat cloth, paper cartons, wood, metal, or ceramics, and as a varnish. The product, when cured, has a high gloss, transparency, and excellent adhesion to the **substrate**. The min. temperature to form coatings varies from -40 to 150°, depending upon the constituents. Sheets of film may be cast, and the dispersion will accept pigments or colorants. Thus, a mixture of soybean oil (mol. weight 2200) 360, glycerol 80, phthalic anhydride 80, sebacic acid 109, poly(iso-Bu methacrylate) (mol. weight 100,000) 30 parts in solvent naphtha (b. 117-145°) 600 parts was placed in a reactor and 3 parts crystallizable **acrylic acid** and 0.2 part lauroyl peroxide were added. O was flushed out (to <0.1%) by a stream of N, and the mixture heated for 2 hrs. at 85° in a stream of N. To this mixture, heated to 90°, Et acrylate 108, Me methacrylate 108, Bz2O2 0.3, lauroyl peroxide 0.2, and, slowly over 3 hrs., a mixture of Et acrylate 160, Me methacrylate 161, Bz2O2 0.5, lauroyl peroxide 0.3, and solvent naphtha 275 parts were added. Finally, during 3 hrs., a solution of 1.2 parts lauroyl peroxide in 25 parts solvent naphtha was added, and the mixture stirred at 90° for 1 hr. The dispersion thus formed had a dry extract consisting of 39.7% polymer and was easily applied by **brush** or spray to Al or steel, cured at 149° for 30 min., to give a transparent film of high gloss and with excellent adhesion to the **substrate**.

CC 52 (Coatings, Inks, and Related Products)

This Page Blank (uspto)

=> d que

L4 1 SEA FILE=REGISTRY ABB=ON PLU=ON STYRENE/CN
 L9 1 SEA FILE=REGISTRY ABB=ON PLU=ON ACRYLIC ACID/CN
 L10 1 SEA FILE=REGISTRY ABB=ON PLU=ON ACRYLAMIDE/CN
 L12 2 SEA FILE=REGISTRY ABB=ON PLU=ON ("DIMETHYLACRYLAMIDE
 HOMOPOLYMER"/CN OR "DIMETHYLACRYLAMIDE, HOMOPOLYMER"/CN)
 L13 4307173 SEA FILE=HCAPLUS ABB=ON PLU=ON SUBSTRATE OR SURFACE OR GLASS
 OR SILIC?
 L14 354874 SEA FILE=HCAPLUS ABB=ON PLU=ON SILICA+PFT,NT/CT
 L15 281364 SEA FILE=HCAPLUS ABB=ON PLU=ON GLASS+PFT,NT/CT
 L16 25366 SEA FILE=HCAPLUS ABB=ON PLU=ON (L13 OR L14 OR L15) AND
 (HYDROPHOB? OR STYRENE? OR L4) AND (HYDROPHIL? OR L9 OR L10 OR
 L12 OR ACRYLAMID? OR DIMETHYLACRYLAMID? OR ACRYLIC ACID)
 L17 12113 SEA FILE=HCAPLUS ABB=ON PLU=ON L16 AND (SUBSTRATE OR GLASS
 OR SILICA)
 L18 1094 SEA FILE=HCAPLUS ABB=ON PLU=ON L17 AND HYDROPHOB? (3A) (LAYER
 OR COAT? OR SURFAC?) AND HYDROPHIL? (3A) (LAYER OR COAT? OR
 SURFAC?)
 L20 1515 SEA FILE=HCAPLUS ABB=ON PLU=ON L17 AND ?STYREN? AND ?ACRYLAMI
 D?
 L21 13 SEA FILE=HCAPLUS ABB=ON PLU=ON L20 AND ?BRUSH?
 L22 6 SEA FILE=HCAPLUS ABB=ON PLU=ON L18 AND ?BRUSH?
 L23 19 SEA FILE=HCAPLUS ABB=ON PLU=ON L21 OR L22
 L28 1554 SEA FILE=HCAPLUS ABB=ON PLU=ON POLYMER? (3A) ?BRUSH?
 L29 21 SEA FILE=HCAPLUS ABB=ON PLU=ON L28 AND HYDROPHOB? AND
 HYDROPHIL? AND (SUBSTRAT? OR SILICA? OR ?GLASS?)
 L30 36 SEA FILE=HCAPLUS ABB=ON PLU=ON L29 OR L23
 L31 5426 SEA FILE=HCAPLUS ABB=ON PLU=ON HYDROPHOB? AND HYDROPHIL? AND
 (SUBSTRAT? OR SILICA? OR ?GLASS?)
 L32 21399 SEA FILE=HCAPLUS ABB=ON PLU=ON "IMMOBILIZATION, MOLECULAR OR
 CELLULAR"+PFT,NT/CT
 L33 268 SEA FILE=HCAPLUS ABB=ON PLU=ON L31 AND (L32 OR IMMOBILI?)
 L34 17318 SEA FILE=HCAPLUS ABB=ON PLU=ON BIOCHEMICAL MOLECULES+PFT/CT
 OR BIOMOLECUL?
 L35 20 SEA FILE=HCAPLUS ABB=ON PLU=ON L33 AND L34
 L36 54 SEA FILE=HCAPLUS ABB=ON PLU=ON L30 OR L35
 L40 5809 SEA FILE=HCAPLUS ABB=ON PLU=ON HYDROPHOB? AND (HYDROPHIL? OR
 WATER SOL? OR WATER DISP?) AND (SUBSTRAT? OR SILICA OR
 ?GLASS?)
 L42 50 SEA FILE=HCAPLUS ABB=ON PLU=ON L40 AND ?BRUSH?
 L43 288 SEA FILE=HCAPLUS ABB=ON PLU=ON L40 AND (L32 OR ?IMMOBIL?)
 L44 52 SEA FILE=HCAPLUS ABB=ON PLU=ON L40 AND L34
 L46 24 SEA FILE=HCAPLUS ABB=ON PLU=ON (L42 AND (L43 OR L44)) OR
 (L43 AND L44)
 L47 2 SEA FILE=HCAPLUS ABB=ON PLU=ON L46 NOT L36

=> d l47 ibib abs hitind 1-2

L47 ANSWER 1 OF 2 HCAPLUS COPYRIGHT 2005 ACS on STN
 ACCESSION NUMBER: 2002:927490 HCAPLUS
 DOCUMENT NUMBER: 138:14232
 TITLE: Functionalization of polylactide (PLA) surface using
 end-functionalized block copolymer of
 α -acetal-poly(ethylene glycol) (PEG)/PLA
 INVENTOR(S): Kataoka, Kazunori; Nagasaki, Yukio; Shibata, Naoya;
 Hoshino, Nobuhiro
 PATENT ASSIGNEE(S): Nanocarrier Co., Ltd., Japan; Iatron Laboratories,

Inc.
 SOURCE: PCT Int. Appl., 22 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|------|----------|-----------------|------------|
| WO 2002096977 | A1 | 20021205 | WO 2002-JP5272 | 20020530 |
| W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG | | | | |
| EP 1405871 | A1 | 20040407 | EP 2002-730784 | 20020530 |
| R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR | | | | |
| US 2004171808 | A1 | 20040902 | US 2003-479246 | 20031201 |
| PRIORITY APPLN. INFO.: | | | JP 2001-161788 | A 20010530 |
| | | | WO 2002-JP5272 | W 20020530 |

AB A method of binding a substance to the free ends of **water-sol.** polymer chains which are bonded at the other ends to a **substrate** surface so as to form a **brush**-like structure and have, at the free ends, reactive functional groups capable of reacting with the substance to be incorporated, by reacting the substance to be incorporated with the reactive functional groups in the presence of a **water-sol.** polymer which has the ability to accelerate the binding, is disclosed. Proteins, DNA, or cells may be incorporated by reacting with a terminal aldehyde group of PEG **immobilized** on latex particle or macromol. micelle. This paper deals with novel approaches established for the construction of a functionalized poly(ethylene glycol) (PEG) layer, PEG-**brushed** layer possessing a reactive group at the free end to tethered PEG chain, on **substrates**. An AB-type block copolymer composed of α -acetal-poly(ethylene glycol) (PEG) as the **hydrophilic** segment and polylactide (PLA) as the **hydrophobic** segment was synthesized, and utilized to construct the functionalized PEG layer on the biodegradable polylactide surface by simple coating. In this way, a PEG-**brushed** layer with a terminal aldehyde group was readily prepared which may have both non-fouling and ligand-binding properties. Based on the characterization of these PEGylated surfaces from a physicochem. (contact angle, potential, ESR) as well as biol. (protein adsorption) point of view, the authors' strategy to construct a functionalized PEG layer was confirmed. Active functional groups were present at the tethered PEG-chain end, these materials will have a high utility in the biomedical field. Attachment of bovine serum albumin and anti C-reactive protein (CRP) rabbit antibody F(ab') fraction, in the presence of PEG6000, is described.

IC ICM C08G085-00
 CC 35-10 (Chemistry of Synthetic High Polymers)
 Section cross-reference(s): 9
 IT Polymers, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)
(block, of **water sol.** and insol. polymers;
functionalization of polylactide (PLA) surface using end-functionalized
block copolymer of α -acetal-poly(ethylene glycol) (PEG)/PLA)

IT **Immobilization, molecular or cellular**
(functionalization of polylactide (PLA) surface using
end-functionalized block copolymer of α -acetal-poly(ethylene
glycol) (PEG)/PLA)

IT Micelles
(macromol., PEG **immobilized** on; functionalization of
polylactide (PLA) surface using end-functionalized block copolymer of
 α -acetal-poly(ethylene glycol) (PEG)/PLA)

IT Latex
(particle, PEG **immobilized** on; functionalization of
polylactide (PLA) surface using end-functionalized block copolymer of
 α -acetal-poly(ethylene glycol) (PEG)/PLA)

IT Polymers, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(**water-sol.**; functionalization of polylactide (PLA)
surface using end-functionalized block copolymer of
 α -acetal-poly(ethylene glycol) (PEG)/PLA)

REFERENCE COUNT: 29 THERE ARE 29 CITED REFERENCES AVAILABLE FOR THIS
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L47 ANSWER 2 OF 2 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2002:539935 HCAPLUS

DOCUMENT NUMBER: 137:90548

TITLE: Polymer **brushes** for **immobilizing**
molecules to a surface or **substrate** having
improved stability

INVENTOR(S): Klaerner, Gerrit; Benoit, Didier; Charmot, Dominique;
Nomula, Srinivas; Piotti, Marcelo E.; Mazzola, Laura
T.

PATENT ASSIGNEE(S): Symyx Technologies, Inc., USA

SOURCE: PCT Int. Appl., 162 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---------------|------|----------|-----------------|----------|
| WO 2002056021 | A2 | 20020718 | WO 2002-US746 | 20020110 |
| WO 2002056021 | A3 | 20030918 | | |

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR,
LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH,
PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ,
UA, UG, US, UZ, VN, YU, ZA, ZM, ZW
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY,
KG, KZ, MD, RU, TJ, TM, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB,
GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA,
GN, GQ, GW, ML, MR, NE, SN, TD, TG

US 2003108879 A1 20030612 US 2002-43394 20020110

PRIORITY APPLN. INFO.: US 2001-271692P P 20010110

AB The invention concerns sensors for determining the presence and concentration
of

bio-mols. in a biol. sample in the form of polymer **brushes**, which comprise a **substrate** having a surface modified with a **hydrophobic** polymer segment, attached to which is a **water-dispersible** or **water-sol.** polymer segment having functional groups that bind probes. The method of synthesis of such sensors preferably includes use of controlled free radical polymerization techniques, which allows for controlled architecture polymers to modify the surface of the **substrate**, and the use of monomers possessing functional groups which do not require activation prior to probe attachment. In this manner functional groups in the polymer chain are removed from the surface, which allows for solution chemical to be more realistically reproduced with the benefits of a solid bound probe.

- IC ICM G01N033-543
- ICS G01N033-545; C08J007-16; C08F293-00; C08F220-00
- CC 9-1 (Biochemical Methods)
- Section cross-reference(s): 35
- ST biosensor polymer **brush immobilization** polymn
- functional group; nucleic acid DNA RNA peptide enzyme lipid hormone drug
- IT Carboxylic acids, properties
- RL: PRP (Properties)
- (derivs.; polymer **brushes** for **immobilizing** mols. to
- a surface or **substrate** having improved stability)
- IT Metals, analysis
- RL: ANT (Analyte); ANST (Analytical study)
- (ions; polymer **brushes** for **immobilizing** mols. to a
- surface or **substrate** having improved stability)
- IT Amino group
- Animal cell
- Biosensors
- Genetic markers
- Hydrophobicity**
- Hydroxyl group
- Immobilization, molecular or cellular**
- Microspheres
- Molecular association
- Molecular recognition
- Molecular weight
- Reaction kinetics
- UV radiation
- (polymer **brushes** for **immobilizing** mols. to a
- surface or **substrate** having improved stability)
- IT Carbohydrates, analysis
- Collagens, analysis
- Elastins
- Enzymes, analysis
- Hormones, animal, analysis
- Lipids, analysis
- Nucleic acids
- Peptides, analysis
- Phosphates, analysis
- Phospholipids, analysis
- RL: ANT (Analyte); ANST (Analytical study)
- (polymer **brushes** for **immobilizing** mols. to a
- surface or **substrate** having improved stability)
- IT Peptide nucleic acids
- RL: ANT (Analyte); ARG (Analytical reagent use); DEV (Device component
- use); ANST (Analytical study); USES (Uses)
- (polymer **brushes** for **immobilizing** mols. to a
- surface or **substrate** having improved stability)

IT DNA
RNA
RL: ARG (Analytical reagent use); DEV (Device component use); ANST (Analytical study); USES (Uses)
(polymer **brushes** for **immobilizing** mols. to a surface or **substrate** having improved stability)

IT Nucleotides, uses
Polymers, uses
cDNA
RL: ARG (Analytical reagent use); DEV (Device component use); PRP (Properties); ANST (Analytical study); USES (Uses)
(polymer **brushes** for **immobilizing** mols. to a surface or **substrate** having improved stability)

IT Carboxylic acids, properties
Glass, properties
Thiols (organic), properties
RL: PRP (Properties)
(polymer **brushes** for **immobilizing** mols. to a surface or **substrate** having improved stability)

IT Polymerization
(radical; polymer **brushes** for **immobilizing** mols. to a surface or **substrate** having improved stability)

IT Drugs
(targets; polymer **brushes** for **immobilizing** mols. to a surface or **substrate** having improved stability)

IT Polymers, properties
RL: PRP (Properties); REM (Removal or disposal); PROC (Process)
(unbound **hydrophobic**; polymer **brushes** for **immobilizing** mols. to a surface or **substrate** having improved stability)

IT 106-91-2, Glycidyl methacrylate 21282-97-3 29513-26-6,
4,4-Dimethyl-2-vinyl-2-oxazolin-5-one
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(polymer **brushes** for **immobilizing** mols. to a surface or **substrate** having improved stability)

IT 38862-24-7P
RL: DEV (Device component use); PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)
(polymer **brushes** for **immobilizing** mols. to a surface or **substrate** having improved stability)

IT 60799-41-9P 129219-08-5P
RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(polymer **brushes** for **immobilizing** mols. to a surface or **substrate** having improved stability)

IT 258352-22-6P
RL: NUJ (Other use, unclassified); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(polymer **brushes** for **immobilizing** mols. to a surface or **substrate** having improved stability)

IT 7440-21-3, Silicon, properties
RL: PRP (Properties)
(polymer **brushes** for **immobilizing** mols. to a surface or **substrate** having improved stability)

IT 109-83-1 2680-03-7, N,N-Dimethylacrylamide
RL: RCT (Reactant); RACT (Reactant or reagent)
(polymer **brushes** for **immobilizing** mols. to a surface or **substrate** having improved stability)

IT 17225-73-9P 318969-33-4P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT
(Reactant or reagent)
(polymer **brushes** for **immobilizing** mols. to a
surface or **substrate** having improved stability)

IT 90120-75-5P
RL: SPN (Synthetic preparation); PREP (Preparation)
(polymer **brushes** for **immobilizing** mols. to a
surface or **substrate** having improved stability)